4.0 REVISED PAGES TO THE DRAFT EIR

This section identifies modifications made to the Draft Environmental Impact Report (EIR) to clarify or amplify its text in response to comments. Such changes are consistent with the provisions in sections 15088.5(b) and 15132 of the CEQA Guidelines. Deletions of text are shown as strike-through text and additions are underlined.

EXECUTIVE SUMMARY

Text has been added on page ES-1 to clarify the lease boundaries:

Onshore Chevron-owned facilities support the offshore lease areas and are located in a nine-acre (3.6-hectare) area near El Segundo Beach on the shoreline side of Vista del Mar. These facilities include a control house, three berth pump stations, two substations, and connecting pipelines and valves. Specifically, these facilities will be used to discharge feedstocks into the Refinery's tanks or to load products or components from the Refinery tanks onto marine vessels.

Offshore Marine Terminal facilities associated with the CSLC lease are located within Santa Monica Bay and include two active berths (Berths 3 and 4) and their associated underwater pipelines that connect these berths to the onshore facilities.

Text was added on page ES-4 to clarify variables that could affect Marine Terminal use:

A large number of variables could affect the refinery operations and the resulting level of Marine Terminal vessel calls, including market forces such as crude oil prices, California demand for gasoline and diesel fuels, increased fuel efficiency regulations, other refinery operations within California, pipeline operations, and California crude oil production levels. These factors could increase or decrease Marine Terminal use. However, the estimated 2040 Marine Terminal vessel visits are considered a worst-case maximum of operations over the lease term.

The following text was modified on page ES-7:

The proposed Project would generate potentially significant environmental impacts in system safety and reliability, water quality, biological resources, air quality, aesthetics, geological resources, land use, planning and recreation, noise, and cultural resources. All of these are associated with accidental spills and the potential future increase in

vessel calls and throughput at the Marine Terminal and potential offshore construction over the life of the lease term.

Impacts to system safety and reliability involve the potential for fires and explosions, spill risk, and disturbance of potentially contaminated seafloor sediments.

Impacts to water quality could occur from oil spills at the Marine Terminal and from vessels in transit that could pollute waters due to oil spills. Impacts to biological resources from oil spills at the Marine Terminal could adversely affect species, Areas of Special Biological Significance, fisheries in the area, marine water quality, and possibly sediment quality over wide areas. Oil spills from vessels in transit could pollute waters and adversely affect avian species.

Impacts to air quality could occur if diesel particulate matter emissions from additional crude oil marine tankers exceed the South Coast Air Quality Management District (SCAQMD) significance threshold for incremental cancer or chronic risk. Using low sulfur fuels would reduce this impact to less than significant~~, but it would still be significant per SCAQMD thresholds~~. The proposed Project would also likely exceed emissions of greenhouse gases (GHG) beyond SCAQMD thresholds.

Table ES-1 was modified to reflect changes to impacts and mitigation measures throughout the document:

Table ES-1
Summary of Environmental Impacts for the Proposed Project

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I = Significant adverse impact that remains significant after mitigation.
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Impact No.	Impact	Impact Class	Recommended Mitigation Measures
Section 4.1 System Safety and Reliability			
SRR-1	Potential for Fires and Explosions	I	**SSR-1a.** Inert Gas Systems and Fire Response. The Applicant shall extend the use of inert gas to all vessels (tankers and barges), if the California State Lands Commission (CSLC) Marine Facilities Division staff deems it feasible, that carry non-grade E cargo, ~~-~~to reduce the possibility of fires and explosions~~.~~. The inert gas systems shall be in accordance with Title 46 of the Code of Federal Regulations Section 32.53. ~~Monitoring shall ensure that oxygen is below 8 percent by volume.~~ Response planning documents shall address response equipment and fire boats that would respond to a fire at the offshore location. These documents shall be completed and submitted to the CSLC staff within one year of ~~lease renewal~~lease approval and reports submitted to CSLC staff when changes are required to the document~~annually thereafter~~. The Applicant shall conduct biennial, or more frequently as needed, fire and response drills with the El Segundo Fire Department as part of its emergency response preparedness training. **SSR-1b.** Lease Modifications. The lease for the facility shall contain a clause allowing the California State Lands Commission (CSLC) to add or modify mitigation measures in the event that cost-effective technologies become available that would significantly improve protection from fires or explosions if they could be readily implemented during the lease term, as defined by "best achievable technology" (PRC Section 8750(d)). Modifications should be made if a fire or explosion occurs during the lease term to take advantage of lessons learned. Annual reports shall be submitted to CSLC staff identifying any lease modifications.
SRR-2	Potential for Spills	I	**SSR-2a.** Pipeline Vacuum System. The Applicant shall ensure that the pipeline vacuum system is operational and able to function at all times when the Marine Terminal is not loading. This shall be conducted within one year

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			of ~~lease renewal~~lease approval and reported~~s submitted~~ to California State Lands Commission ~~CSLC~~staff ~~annually thereafter~~. **SSR-2b.** Pipeline Testing System. The Applicant shall ensure that the following activities accompany all vessel and barge loading and unloading operations and that these measures are incorporated in the emergency response plans, terminal operations plans, and vessel transfer procedures, as applicable: 1. The pipeline and hoses shall be pressure tested three times during each cargo transfer: once before the vessel or barge is connected; once after the vessel or barge is connected; and once after the vessel or barge is disconnected from the pipeline. Each pipeline shall be additionally pressure-checked monthly. 2. If the pressure cannot be maintained once the pipeline is pressured, the system shall be placed under a vacuum and divers shall be mobilized to investigate the possible leak. 3. A line boat and tug shall be at the berth during all transfer operations to visually monitor for leaks. ~~1.~~4. A boat at the berth shall be equipped with at least 600 feet of boom for rapid response to a spill. Periodic drills shall be performed to demonstrate the ability to deploy and maneuver boom to the satisfaction of California State Lands Commission staff and Office of Spill Prevention and Response. ~~re-assess the pressure point analysis system to ensure that it is utilizing the most recent technologies, including pressure sensor accuracy and maintenance and testing, sensor location, and pressure point analysis software, and is designed to detect pressure anomalies during loading operations. This shall be conducted within one year of lease renewal~~lease

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			approval~~ and reports submitted to CSLC staff annually thereafter.~~ **SSR-2c.** Testing of ~~Spill Mitigation~~Leak Detection Equipment. Within one year of lease issuance and annually thereafter, ~~T~~the Applicant shall ~~conduct periodic (at least annual) testing of~~ the ~~vacuum and pressure point~~leak detection systems (including the vacuum system and systems to detect leaks while loading) ~~analysis~~ by utilizing by-pass valves, or other equivalent methods, to verify the function of these systems and to make adjustments as needed. ~~This shall be conducted within one year of lease and~~ Test reports shall be submitted to ~~CSLC~~ California State Lands Commission staff annually~~annually thereafter~~ and shall include a discussion as to whether the system is using the most recent technology. **SSR-2d.** Pipeline Leak Detection. Within one year of ~~lease renewal~~lease approval, the Applicant shall ensure a leak detection system is in place during all transfer operations that can detect a leak of two percent of the flow rate within five minutes. This could involve installing flow meters at both the shipping end and the receiving end of the loading pipelines ~~are equipped with flow meters~~ that utilize a means of conducting automatic and continuous flow balancing, a pressure-type system, or other equivalent methods~~ to an accuracy of at least two percent of maximum design flow rate within five minutes~~. Any deviations shall activate an alarm system at both the shipping and receiving locations. ~~The system shall be tested at least annually by utilizing by-pass valves, or other equivalent methods, to assess the capability of the leak detection systems. Annual reports shall be submitted to CSLC.~~ **SSR-2e.** Double Hulled Vessels. During the term of the 30-year lease, all vessels that call at the Marine Terminal shall be double hulled. **SSR-2f.** Pipeline Inspections. In addition to periodic inspections and surveys, within one year of ~~lease renewal~~lease approval, the Applicant shall

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			implement smart-pig inspections, cathodic inspections of the entire pipelines, bathymetric surveys and visual inspections (either remote-operated-vehicle or camera-equipped diver to ensure a record of the inspection) ~~inspections~~ of all Marine Terminal pipelines. ~~This would require modifying some existing pipelines to allow smart-pigs to pass through all pipelines.~~ The entire pipeline route and berths ~~should~~ shall be visually inspected, ~~,~~ and bathymetric surveys conducted, at least every three years ~~or~~ and after major winter storms. At a minimum, ~~V~~visual surveys shall inspect ~~a minimum of~~ unsupported ~~spans~~free spans and vortex shedding, anchors and mooring lines, and other anomalies. The cathodic protection testing should be conducted per National Association of Corrosion Engineers SRP0169 ~~and API570~~. Close interval cathodic protection testing should be conducted every three to five years to ensure that the cathodic protection system is operating correctly throughout the entire length of all the pipelines (onshore and offshore). Smart-pigging shall be conducted every three years or to the satisfaction of the California State Lands Commission (CSLC) staff. Written results of each inspection in the form of a report shall be submitted to the CSLC staff ~~annually~~ and pipelines repaired as necessary. **SSR-2g.** Bow Tube and Thruster Leaks. During the term of the 30-year lease, the Applicant shall implement techniques to detect bow tube and thruster leaks for all vessels. **SSR-2h.** Motor Operated Valve System. During the term of the 30-year lease, the Applicant shall ensure that the motor operated valve (MOV) control system is reliable through testing and maintenance procedures, as indicated in past process hazards reports, and the results of testing shall be submitted to the California State Lands Commission staff annually. **SSR-2i.** Automatic Identification System Shipboard Equipment. During the term of the 30-year lease, all vessels calling at the Marine Terminal shall be

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			equipped with shipboard automatic identification system (AIS) equipment. **SSR-2j.** Berm and Drainage at Onshore Marine Terminal. The Applicant shall install drain/sump protection in the form of sealable coverings, valves, drainage procedures, or another methods to prevent flow of spilled oil through the drains/sumps at the onshore areas of the Marine Terminal to the environment. The drain/sump protection would prevent a spill of material at the loading pumps or other Marine Terminal equipment from entering the drains/sumps and thereafter affecting the ocean. All areas of the onshore Marine Terminal shall be protected by berms that can contain a worst-case discharge from the pumps or pipelines, including potential drain-down from Refinery tankage. Onshore pipelines shall be protected from vehicle impacts. These protections shall occur within one year of ~~lease renewal~~lease approval and a report~~s~~ shall be submitted to California State Lands Commission staff ~~CSLC~~ including drain/sump descriptions and measures taken and a survey of the onshore areas with spill capture volumes ~~annually thereafter~~. **SSR-2k.** Pipeline Maintenance. Within one year of ~~lease renewal~~lease approval, the Applicant shall ensure that the recommendations from all previous hazard and operability studies and the cathodic protection system reports are implemented~~, specifically the use of dielectric fittings, periodic offshore cathodic protection surveys and potentials, replacement of deep well anodes as necessary, monthly readings of rectifier current and voltage, inspection of the pipeline casings related to cathodic potential and corrosion, and periodic onshore and offshore inspection of pipeline systems by corrosion engineers~~. HAZOP studies shall be updated as required by the EPA or OSHA and reports submitted to California State Lands Commission staff ~~CSLC annually.~~
SSR-3	Disturbance of Potentially Contaminated Seafloor	II	**SSR-3.** Sampling Program for Sediments Within the Proposed Project.

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	Sediments		Sixty days prior to the start of any major planned offshore construction (ongoing during construction, as applicable, but excluding routine inspection, maintenance, and repair) ~~and prior to conducting any offshore activities~~ that would disturb sediments, the nature of potential contamination within these sediments shall be defined. Samples should be collected and analyzed, and results summarized in a report to the California State Lands Commission staff ~~and other interested parties~~. This report should include, at a minimum, recommendations to minimize disruption of any identified contaminated sediments, including removal if necessary. Sediments disturbed during construction found to be contaminated shall be appropriately managed~~treated~~ prior to conducting any offshore activities.
Section 4.2 Water and Sediment Quality			
WSQ-1	Oil Spills	I	**SSR-2a** through **SSR-2k.** The Applicant shall implement these measures to reduce the frequency and impacts of spills by decreasing detection times and increasing response capabilities. This process shall occur within one year of lease renewal and reports submitted to California State Lands Commission staff annually thereafter.
WSQ-2	Disturbance of Seafloor Sediments	II	**SSR-3.** Sampling Program for Sediments Within the Proposed Project. Sixty days prior to the start of any major planned offshore construction (ongoing during construction, as applicable, but excluding routine inspection, maintenance, and repair) ~~and prior to conducting any offshore activities~~ that would disturb sediments, the nature of potential contamination within these sediments shall be defined. Samples should be collected and analyzed, and results summarized in a report to the California State Lands Commission staff ~~and other interested parties~~. This report should include, at a minimum, recommendations to minimize disruption of any identified contaminated sediments, including removal if necessary. Sediments disturbed during

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			construction found to be contaminated shall be appropriately managed~~treated~~ prior to conducting any offshore activities. **WSQ-2.** Sediment Sampling within Scour Areas. The Applicant shall perform chemical analysis of sediment samples collected from within the propeller-wash scour areas beneath Berths 3 and 4, and if contaminant concentrations exceed biological effects thresholds, the Applicant shall remediate the contamination or move the Berth to uncontaminated areas. The field sampling and analysis program shall be performed at least once for the existing berth locations and written reports shall be submitted to the California State Lands Commission staff in accordance with MM SSR-3 60 days prior to the start of any construction and shall be ongoing during construction (as applicable). Additional sediment sampling, analysis, and reporting shall be conducted within projected scour areas whenever the berths are relocated more than 500 feet (152 m) from their present locations.
Section 4.3 Biological Resources			
BIO-1	Oil Spill Impacts to Marine Biological Resources	I	**BIO-1a.** Update the Oil Spill Contingency Plan to Reflect the Project Changes. The Applicant shall update the Oil Spill Contingency Plan to incorporate changes in activities that result from the proposed Project. The revised plan shall be approved by the California Department of Fish and Game (CDFG) Office of Spill Prevention and Response (OSPR) and

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			submitted to California State Land Commission (CSLC)- staff within one year of ~~lease renewal~~lease approval ~~and~~ with annual ~~submit~~ reports submitted to CSLC staff thereafter~~to CSLC staff annually thereafter~~. ~~For example, the~~The plan shall incorporate detailed response procedures for marine oil spills resulting from vessel groundings or collisions, as well as for pipeline failure and failures occurring during transfer of the oil to and from the barge. Worst-case discharge scenarios shall be updated accordingly. In addition, lessons learned from the response and cleanup of the 1997 Platform Irene or 2010 Deepwater Horizon oil spills shall be incorporated into the Response Plan. ~~These lessons include operator training in recognizing the significance of deviations in pipeline operating parameters, inspections required to restarting equipment that automatically shuts down in response to a process deviation, and rapidly implementing surveillance activities following process deviations to determine if a spill has occurred.~~ The personnel and training sections of the Oil Spill Contingency Plan shall be updated and identify training requirements for all personnel that would be utilized to respond to oil spills. At a minimum, new personnel shall be trained immediately upon their hiring in the overall operational aspects of oil spill response, including the proper use of all equipment that would be utilized in oil spill response. Annual training for all personnel, which is a Federal requirement, shall also be included in the Oil Spill Contingency Plan to provide personnel with an understanding of their training responsibilities. The annual training shall include training in the operation of new equipment that may be utilized in oil spill response, retraining in the operation of existing equipment, and review of the oil spill response requirements that are identified in the Oil Spill Contingency Plan. **BIO-1b.** Vessels That Call on the Terminal Shall Implement Their Own Oil

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			Spill Response Plan. The Applicant shall revise its Vessel Pre-Arrival Questionnaire for all arriving vessels to verify compliance with the requirements of 33 CFR 155, Subpart D. The Vessel Pre-Arrival Questionnaire shall require the vessel operator to provide the date and document number of the approved Oil Spill Response Plan, the plan to be available onboard, and specific elements of the response plans be complete, including but not limited to: 1. Procedures to mitigate suspected cargo tank or hull leaks and spills associated with cargo transfers, including transfer system leaks and tank overflow; 2. Procedures related to grounding and collisions, explosions, fire, hull failures, excessive list, or equipment failure; 3. Procedures for the crew to deploy discharge-removal equipment; and ~~1.~~4. The status and availability of discharge-removal equipment.~~This plan shall comply with 33 Code of Federal Regulations 155, Subpart D and shall be submitted within one year of lease renewal~~lease approval~~ and reports submitted to.~~
BIO-2	Oil Spill Impacts to Commercial and Recreational Fishing	I	**BIO-1a, BIO-1b,** and **SSR-2a** through **SSR-2k.** These mitigation measures should occur 60 days prior to the start of any construction and be ongoing during construction (as applicable).
BIO-3	Vessel Traffic and Marine Construction Impacts to Biological Resources	II	**BIO-3.** Marine Mammal and Turtle Contingency Plan. The Applicant shall ensure that ~~vessel operators develop and implement~~ a contingency plan is developed and implemented for all vessel operators utilizing the Marine Terminal (including tankers, line boats, and launches) that focuses on recognition and avoidance procedures when marine mammals and turtles

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			are encountered ~~at sea~~within 12 nautical miles of the California shoreline. The plan shall be submitted within one year of ~~lease renewal~~lease approval and reports shall be submitted to California State Land Commission ~~CSLC~~ staff annually thereafter. Minimum components of the plan include: 1. Existing and new vessel operators shall be trained by a marine mammal expert to recognize and avoid marine mammals and turtles prior to Project-related activities. Training sessions shall focus on the identification of marine mammal and turtle species, the specific behaviors of species common to the Project area and transport routes, and awareness of seasonal concentrations of marine mammal and turtle species. The operators shall ~~be re-trained~~complete refresher training annually. 2. A minimum of two ~~marine mammal~~ observers shall be placed on all support vessels during the spring and fall gray whale migration periods (generally December through May), and during periods/seasons when other marine mammals, such as migrating fin, blue, and humpback whales (generally June through November), are known to be in the Project area in relatively large numbers. Observers can include the vessel operator and/or crew members, as well as any Project worker that has received proper training. Vessel operators and crews shall maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species. 3. Vessel operators will make every effort to maintain a distance of 1,000 feet (305 m) from sighted whales, and~~-~~ 150 feet (45.7 m) or greater from sea turtles or smaller cetaceans whenever possible. 4. When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), vessel operators shall attempt to remain parallel to the animal's course. When paralleling whales, supply vessels will operate

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			at a constant speed that is not faster than the whales' and shall avoid excessive speed or abrupt changes in direction until the cetacean has left the area. 5. Per NOAA recommendations, and when safety permits (i.e., excluding during poor sea and weather conditions, thereby ensuring safe vessel maneuverability under those special conditions), vessel speeds shall not exceed 11.5 mph (10 knots) when mother/calf pairs, groups, or large assemblages of cetaceans (greater than five ~~in number~~individuals) are observed near an underway vessel. ~~,~~ A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures, such as decreasing speed and avoiding sudden changes in direction, should always be exercised. The vessel should ~~attempt to~~ route around the animals, maintaining a minimum distance of 300 feet (91.4 m) whenever possible. 6. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, operators will reduce speed and shift the engine to neutral. Vessel operators will not engage the engines until the animals are clear of the area. 7. Support vessels shall not cross directly in front of migrating whales, other threatened or endangered marine mammals, or marine turtles. 8. Support vessels shall not separate female whales from their calves. 9. Vessel operators will not herd or drive whales. 10. If a whale engages in evasive or defensive action, support vessels will drop back until the animal moves out of the area. 11. Collisions with marine wildlife will be reported promptly to the Federal

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			and state agencies listed below pursuant to each agency's reporting procedures. National Marine Fisheries Service Southwest Region, Stranding Coordinator~~, Southeast Region (currently, Joe Cordaro)~~ ~~National Marine Fisheries Service~~ Long Beach, CA 90802-4213 (~~310~~562) 980-4017 Enforcement Dispatch Desk California Department of Fish and Game Enforcement Dispatch Desk Long Beach, CA 90802 (562) 590-5132 or (562) 590-5133 California State Lands Commission Environmental Planning and Management Division Sacramento, CA 95825-8202 (916) 574-1900 ~~**BIO-3b.** Burial of Pipelines. Burial of subsea pipelines and cables to a depth of 3.28 feet (1 m) except where precluded by seafloor substrates. A 3.28 feet (1 m) burial depth would sufficiently protect gray whales foraging in bottom sediments on their northbound migration. It is understood that this burial depth may not be achieved in areas where there is localized, higher sediment resistance, or substantial variations in bottom slope or cable ship speed; however, such locations should be documented and monitored during regular inspection surveys. If, during inspection, sections of the cable or pipeline are found to be exposed contrary to the original as-built burial configurations, remedial actions will be taken within 60 days to re-bury the lines. Specific actions shall be pre-approved by CSLC staff. This mitigation~~

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			~~measure shall occur 60 days prior to the start of any construction and shall be ongoing during construction (as applicable).~~
BIO-4	Vessel Traffic and Marine Construction Impacts to Commercial and Recreational Fishing	II	**BIO-4.** Use Designated Marine Traffic Corridors. Support and tankering vessels shall use designated traffic corridors where possible during the term of the 30-year lease. ~~See **BIO-3b**.~~
BIO-5	Oil Spill Impacts to Onshore Biological Resources	I	**BIO-5.** Update the Oil Spill Contingency Plan to Protect Sensitive Resources. The Oil Spill Contingency Plans (OSCP) shall be revised and updated to address protection of sensitive biological resources and revegetation of any areas disturbed during an oil spill from the proposed pipeline or cleanup activities. The updated OSCP shall be submitted within one year of ~~lease renewal~~lease approval and reports submitted to California State Land Commission (CSLC) staff annually thereafter. The revised OSCP shall, at a minimum, include: 1. Specific measures to avoid impacts on Federal- and State-listed endangered and threatened species and Environmentally Sensitive Habitat Areas during response and cleanup operations. Where feasible, low-impact, site-specific techniques such as hand-cutting contaminated vegetation and using low-pressure water flushing from vessels to remove spilled material from particularly sensitive wildlife habitats, such as coastal estuaries, i.e., Ballona Wetlands, because procedures such as shoveling, bulldozing, raking, and drag-lining can cause more damage to a sensitive habitat than the oil spill itself. The Oil Spill Contingency Plan shall also evaluate the non-cleanup option for ecologically vulnerable habitats such as coastal estuaries. 2. Specific measures requiring spill response personnel to be adequately trained for response in terrestrial environments and spill containment

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			and recovery equipment to be maintained in full readiness. Inspection of equipment and periodic drills shall be conducted at least annually and the results evaluated so that spill response personnel are familiar with the equipment and with the Project area including sensitive onshore biological resources. 3. When habitat disturbance cannot be avoided, stipulations for development and implementation of site-specific habitat restoration plans and other site-specific and species-specific measures appropriate for mitigating impacts on local populations of sensitive wildlife species and to restore native plant and animal communities to pre-spill conditions. Access and egress points, staging areas, and material stockpile areas that avoid sensitive habitat areas shall be identified. The Oil Spill Contingency Plan shall include species- and site-specific procedures for collection, transportation and treatment of oiled wildlife, particularly for sensitive species. 4. Procedures for timely re-establishment of vegetation that replicates the habitats disturbed (or, in the case of disturbed habitats dominated by non-native species, replaces them with suitable native species) including: measures preventing invasion and/or spread of invasive or undesired plant species; restoration of wildlife habitat; restoration of native communities and native plant species propagated from local genetic sources including any sensitive plant species (such as the southern tarplant); and replacement of trees at the appropriate rate. 5. Monitoring procedures and success criteria to be satisfied for restoration areas. The success criteria shall consider the level of disturbance and condition of the adjacent habitats. Monitoring shall continue for three to five years, depending on habitat, or until the success criteria are met. Appropriate remedial measures, such as

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			replanting, erosion control or control of invasive plant species, shall be identified and implemented if it is determined that the success criteria are not being met. 6. The OSCP shall follow all the applicable portions of the Area Contingency Plan and National Contingency Plan under guidance from the appropriate lead agency (e.g., Office of Spill Response and Prevention).
Section 4.4 Air Quality			
AQ-1	Exceedance of Incremental Health Risk Threshold During Project Operations	II	**AQ-1.** Low Sulfur Furls in Marine Main and Auxiliary Engines and Speed Limits. Starting at the beginning of the new 30-year lease period and continuing throughout the 30-year lease period, all main and auxiliary engines on crude oil marine tankers calling at the Chevron El Segundo Marine Terminal shall use marine diesel oil or marine gas oil with a maximum of 0.1~~2~~ percent sulfur by weight. In the event that marine diesel oil or marine gas oil with maximum 0.1 percent sulfur by weight content is not available, tankers shall use marine diesel oil or marine gas oil with maximum 0.2~~%~~ percent sulfur by weight content. This measure shall apply while the tankers are in waters of the South Coast Air Basin as defined in the South Coast Air Quality Management District (SCAQMD) Rule 1142~~within 20 nautical miles (37.0. kilometers) of Point Fermin~~, including while hoteling or transferring product at the Marine Terminal. In addition, all marine tankers calling at the Chevron El Segundo Marine Terminal~~,~~ shall reduce speed to 12 knots within waters of the South Coast Air Basin as defined in AQMD Rule 1142.~~, and the POLA/POLBmain engines while in transit and auxiliaryauxiliaryauxiliary or the use of slide valves or other technologies to reduce DPM from main engines while in transit within District waters~~
AQ-2	Emissions of Greenhouse Gases Within the SCAB	I	**AQ-2.** Greenhouse Gas Monitoring and Reduction Strategies. The

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	Could Exceed SCAQMD Thresholds		Applicant shall implement a program to quantify and ~~reduce~~ report to the California State Land Commission ~~CSLC~~ staff greenhouse gas emissions associated with Marine Terminal operations within the South Coast Air Basin (SCAB) and within California. If these emissions exceed the greenhouse gas (GHG) emissions estimates associated with the baseline operations, then a GHG emission reduction program shall be implemented~~,~~ to reduce emissions to less than the baseline GHG emissions. The program could include measures such as: using green electrical power to run onshore equipment; requiring tugs to use biodiesel;~~, using marine diesel oil fuels in vessel main and auxiliary engines while in the SCAB~~utilizing shore power systems; utilizing shore-side pumping systems instead of vessel-powered pumps; further ~~and~~ reducing vessel speed while in the SCAB; or other measures including offsite GHG reduction programs in the community~~within one year of lease renewal and submit reports to CSLC staff annually thereafter~~.
Section 4.5 Aesthetics			
AES-1	Oil Spills and Resultant Cleanup Operations Affect Visual Quality	I	**SSR-1a, SSR-1b, SSR-2a** through **SSR-2k,** and **BIO-1a** and **BIO-1b**
Section 4.6 Geological Resources			
GEO-1	Rupture of Facilities from Earthquake Motion	I	**GEO-1a. SSR-1a**, **SSR-1b**, **SSR-2a** through **SSR-2k**,and **BIO-1a** and **BIO-1b** **GEO-1b.** Seismic Resistant Design. The Applicant shall perform seismic evaluation and design for all existing facilities or pipelines and employ

Table ES-1
Summary of Environmental Impacts for the Proposed Project

Impact Class
I = Significant adverse impact that remains significant after mitigation.
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IV = Beneficial impact.

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
			current industry seismic design guidelines including but not limited to: Guidelines for the Design of Buried Steel Pipe by American Lifeline Alliance (2001), Guidelines for the Seismic Design and Assessment of Natural Gas and Liquid Hydrocarbon Pipelines by Pipeline Research Council International ~~(PRCI)~~ (2004), and California State Lands Commission (CSLC) Marine Oil Terminal Engineering and Maintenance Standards for seismic resistant design of the pipeline. The seismic evaluation of existing facilities shall be conducted in accordance with the Local Emergency Planning Committee Region 1 Guidance for California Accidental Release Prevention ~~(CalARP)~~ Seismic Assessments including a walkthrough by a qualified seismic engineer. In addition, post-event inspections must follow the Marine Oil Terminal Engineering and Maintenance Standards guidelines. This evaluation and design shall be conducted within one year of ~~lease renewal~~lease approval and reports submitted to CSLC staff annually thereafter. **GEO-1c.** Seismic Inspection. During the term of the 30-year lease, the operator shall cease associated pipeline operations and inspect all project-related pipelines and equipment ~~storage tanks~~ following any seismic event in the region (Los Angeles County and offshore waters of the Santa Monica Bay and southern Channel Islands) that produces a ground acceleration of 5 percent of gravity (0.05 g) at the Marine Terminal site. ~~that exceeds a ground acceleration of 13 percent of gravity (0.13 g).~~ The operator shall report the findings of such inspection to the California State Lands Commission (CSLC) staff, the city of El Segundo, and the County of Los Angeles. The operator shall not reinstate operations of the Marine Terminal and associated pipelines within the city of El Segundo until authorized by the ~~California State Lands Commission~~CSLC.
GEO-2	Oil Spills from Tsunami Wave Damage	I	**GEO-2.** Tsunami Alert. Tsunami response training and procedures shall be

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Impact No.	Impact	Impact Class	Recommended Mitigation Measures
			developed to assure that construction and operations personnel will be prepared to act in the event of a large seismic event. As part of the overall emergency response planning for this project, the procedures shall include immediate evacuation requirements in the event that a large seismic event is felt that could affect the proposed Project site such that all precautions can be made in the event of a local tsunami. This shall include the departure of all vessels in berth or in the area. These procedures shall be submitted within one year of the ~~lease renewal~~lease approval and reports submitted to California State Lands Commission staff annually thereafter.
GEO-3	Oil Spills as a Result of Liquefaction	I	**GEO-1a** through **GEO-1c**
Section 4.7 Land Use, Planning and Recreation			
LUPR-1	Accidental Oil Releases Could Affect Recreational Activities	I	Measures provided in the Oil Spill Contingency Plan and identified in **MM SSR-1a** and **SSR-1b**, **SSR-2a** through **SSR-2k**, and **SSR-3** and **MM BIO-1a** and **BIO-1b**, **BIO-3a** ~~and **BIO-3b**~~, **BIO-4**, and **BIO-5**
Section 4.8 Noise			
NOI-1	Construction Could Increase Noise Levels at Beach Areas	II	**NOI-1.** Construction Noise Mitigation. Construction activities shall be limited to the hours between 7:00 am and 6:00 pm and shall not occur during the weekends or on Federal holidays. A Noise Mitigation Plan, as required by the city of El Segundo (General Plan objective N.1-2), shall be prepared by the applicant to minimize noise impacts on beach goers. The Noise Mitigation Plan shall be submitted to the California State Lands Commission staff for review and approval 60 days prior to the start of any construction.
Section 4.9 Energy			
None	None	NA	NA
Section 4.10 Cultural Resources			

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Impact No.	Impact	Impact Class	Recommended Mitigation Measures
CUL-1	Damage to or Disruption of Prehistoric or Historic Resources	II	**CUL-1a.** Cultural Resources Avoidance Plan. Sixty days prior to the start of any construction activities, if any structure 45 years and older will be affected by the proposed Project, the structure(s) shall be assessed and evaluated for potential historical significance, including, but not limited to, eligibility for listing under the California Register of Historical Resources. If the resource is determined to be eligible for listing in the California Register, a cultural resources avoidance plan shall be prepared to identify means to avoid impacts to cultural resources, if feasible. If avoidance is determined to be infeasible, a research and recovery plan shall be prepared. In the event that archaeological resources are unearthed during Project subsurface activities, all earth-disturbing work within a 200-meter radius must be temporarily suspended or redirected until an archaeologist has evaluated the nature and significance of the find. After the find has been appropriately mitigated, work in the area may resume. This shall be an ongoing process during construction (as applicable). **CUL-1b.** Phase I Field Reconnaissance. Prior to finalization of the location for pipeline rearrangement or replacement and 60 days prior to the start of any construction, Phase I field reconnaissance of the off-shore Marine Terminal area will gather geophysical data, including magnetometer and side scan sonar runs to identify any cultural resources. Shallow water scuba surveys may be required in areas that vessels cannot access. Findings from the analyses of the geophysical data will be compared with archival information and databases maintained by the ~~CSLC~~ California State Lands Commission and Bureau of Ocean Energy Management, Regulation, and Enforcement. This shall be an ongoing process during construction (as applicable). **CUL-1c.** Phase II Resource Evaluation. If resources that will be impacted are encountered and identified in Phase I, Phase II will evaluate the

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Impact No.	Impact	Impact Class	Recommended Mitigation Measures
			resource as to its eligibility to the California Register by a qualified marine archaeologist. For offshore resources, this phase consists of a survey of the identified resources using a Remotely Operated Vehicle or scuba reconnaissance, if necessary, to collect further information about the resource, such as intactness, formal identification, and information necessary to provide an evaluation of its significance to California history. This evaluation shall occur 60 days prior to the start of any construction and shall be an ongoing process during construction (as applicable). **CUL-1d.** Phase III Cultural Resources Avoidance Plan. Phase III would be required if the resource is determined to be eligible for listing in the California Register. ~~60~~ Sixty days prior to the start of any construction, a cultural resources avoidance plan shall be prepared to identify means to avoid impacts to cultural resources, if feasible, including modifications to the location of the pipelines. If avoidance is determined to be infeasible, a research and recovery plan shall be prepared. In the event that archaeological resources are unearthed during Project subsurface activities, all earth disturbing work within a 200-meter radius must be temporarily suspended or redirected until an archeologist has evaluated the nature and significance of the find. After the find has been appropriately mitigated, work in the area may resume. This shall be an ongoing process during construction (as applicable).

1.0 INTRODUCTION

The following text on page 1-1 was modified to distinguish the Marine Terminal from the Refinery:

The Chevron El Segundo Marine Terminal Lease Renewal Project (Project) involves Chevron Products Company (Chevron) entering into a new 30-year lease (current lease PRC 5574.11) of tide and submerged state lands offshore of the city of El Segundo in Los Angeles County, from the California State Lands Commission (CSLC) for continued operations at the Chevron El Segundo Marine Terminal (Marine Terminal). The Marine Terminal, which is part of the system that moves petroleum products to and from the ~~refinery, is~~ adjacent Chevron El Segundo Refinery, has been operating since 1911, when the Refinery that it serves opened. The new lease would allow Chevron to continue operating the Marine Terminal for a 30-year period beginning in 2010 and ending in 2040. The proposed Project would involve continuing current operations with a one percent increase in throughput and implementing future maintenance activities as needed at the Marine Terminal through the year 2040.

The following text on page 1-3 was modified to distinguish the offshore area:

The study area boundary includes offshore and onshore elements of the Marine Terminal. The offshore lease area is an approximately 221-acre (89.4-hectare) footprint of state lands leased to Chevron by the CSLC. The onshore facility is a nine-acre (3.6-hectare) parcel of Chevron-owned land approximately 200 feet (70 meters) in width between Vista Del Mar and the shore. Refer to Figures 2-4 and 2-8 in Section 2.0, Project Description, for the location of offshore and onshore facilities, respectively. The Project action to be taken by the CSLC does not include the onshore facilities.

The following text on page 1-4 was modified to clarify Marine Terminal exports:

The Marine Terminal imports crude oil and exports petroleum products via marine vessels to and from Chevron's El Segundo Refinery. Normal crude oil throughputs for the El Segundo Refinery range up to 270,000 barrels per day, 80 percent of this throughput is received through the Marine Terminal. The Marine Terminal has the capability to export~~s~~ diesel fuel, gas oil, ~~number 6~~ fuel oil, commercial jet fuel, fluidized catalytic cracker light cycle oil, crude oil residuum, motor gasoline, and motor gasoline components.

2.0 PROJECT DESCRIPTION

The following text on page 2-6 was modified to clarify the Marine Terminal lease boundaries:

The CSLC lease and regulatory boundary areas include offshore and ~~onshore~~ tideland Marine Terminal facilities. The Marine Terminal~~,~~ is part of the system that moves petroleum products to and from the ~~Refinery, is located~~ adjacent ~~to~~ Chevron~~'s~~ petroleum Refinery. The Marine Terminal lease area is an approximately 221-acre (89.4-hectare) footprint of public land leased from the CSLC as a barge and tanker facility for crude oil and petroleum products. The lease boundaries include the following areas:

- ~~The onshore portion located immediately west of the Refinery and Vista Del Mar Road along the beach, which includes the pump stations, control house, two substations, and a helicopter landing pad;~~

- Circular areas encompassing offshore Berths 3 (1,000-foot [304.8 meters {m}] radius) and 4 (1,210-foot [368 m] radius);

- Active pipeline corridors ranging from 50 to 60 feet (15.2 to 18.3 m) wide, running the length of the active pipelines from the onshore ~~lease~~ area to the berths;

- An abandoned pipeline corridor, 60 feet (18.3 m) wide, from the onshore Marine Terminal area to the abandoned Berth 1 area; and

- An area, approximately 900 by 160 feet (274.3 by 48.8 m), encompassing the rock groin.

The lease areas are supported by an onshore area immediately west of the Refinery and Vista Del Mar Road along the beach, which includes the pump stations, control house, two substations, and a helicopter landing pad. Chevron owns the onshore area.

The following text on page 2-24 was clarified:

Chevron Southern California lightering operations are conducted in an area known as Echo-PAL. The Echo-PAL location is USCG-approved and is a minimum of 20 miles (32.2 km) offshore to a maximum of approximately 30 miles (48.3 km) offshore of the San Diego County coastline. This area is outside of the South Coast Air Quality Management District (SCAQMD) jurisdiction and is within the U.S. Exclusive Economic

Zone. The Echo-PAL lightering area is shown in Figure 2-1. The Echo-PAL area is not exclusive for Chevron use; it also serves other terminals in the area. From lightering vessels, not all the oil is discharged at the Marine Terminal. Sometimes, only part of the cargo from the VLCC and ULCC is offloaded and delivered to the Marine Terminal and some of the cargo may be offloaded and delivered to POLA/POLB terminals operated by other companies, or delivered to other terminals.

The number of VLCC and ULCC tankers lightering at the Echo-PAL location in 2006, 2007, and 2008 was 41, 45, and 53 vessels, respectively, generating 94, 68, and 98 lightering vessel calls to the Marine Terminal, for an average rate of 1.87 Marine Terminal calls per VLCC.

Onshore Facilities

The Chevron-owned onshore Marine Terminal facilities are an integral part of the Marine Terminal operations. The onshore Marine Terminal ~~onshore~~ facilities consist of pipelines and equipment used to discharge feedstocks into the Refinery's tanks or to load products from the Refinery tanks onto vessels. There are three systems onshore: Berth system 3C is used to load or discharge light products or components; Berth system 3B is used to load or unload various types of gas oils, fuels oils, and crude oils; and Berth system 4 is used to load and unload various types of crude oils, gas oils, or fuel oils.

Text was added on page 2-31 to include fireboats in Marina Del Ray:

Fire boats are available from the POLA, ~~and~~ POLB, and Marina Del Rey to assist with fire suppression. These fire boats would only be called upon in the event that an instantaneous response using fire extinguishing systems located on board the moored vessel and accompanying tugs at the berths could not control the fire.

Text was added on page 2-32 to include information provided by the Applicant:

A large number of variables could affect the Refinery operations and the resulting level of Marine Terminal vessel calls, including market forces such as crude oil prices, California demand for gasoline and diesel fuels, increased fuel efficiency regulations, other Refinery operations within California, and California crude oil production levels. These factors could increase or decrease Marine Terminal use. According to recent letters from the Applicant, there are no plans to make any additional modifications to the Refinery during the proposed lease cycle that would substantially increase current

capacity for the foreseeable future. However, the estimated 2040 Marine Terminal vessel visits are considered a worst-case maximum of operations over the lease term.

Text was added on page 2-33 to include information provided by the California Department of Transportation:

The first phase would require assembly of the pipeline string at a location at the POLA or POLB. At this site, the pipeline segments would be assembled, inspected, and launched for towing to the offshore construction site. Construction equipment required during this phase would include two welders operating six hours per day, one dozer operating four hours per day, two sidebooms operating five hours per day, and two mobile cranes operating five hours per day. Three transport trucks would transport equipment and supplies to and from the site daily. The trucks would travel approximately 50 miles (80.5 km) per day and it is estimated that 15 construction workers would travel approximately 50 miles (80.5 km) per day for each construction phase. Any oversized trucks would require a permit from the California Department of Transportation to use State highways.

3.0 ALTERNATIVE AND CUMULATIVE PROJECTS

Text was added on page 3-3 to clarify the definition of feasible alternatives:

The Notice of Preparation also proposed significance criteria that could be applied to each impact area; these criteria are based on previous analyses of marine terminals and offshore loading facilities for which the CSLC was the Lead Agency. For the screening analysis, the technical and regulatory feasibility of various potential alternatives was assessed at a general level; specific feasibility analyses are not necessary for this purpose. Feasibility was assessed using reverse reason; that is, an attempt was made to identify anything about the alternative that would be infeasible on technical or regulatory grounds. The CEQA does not require elimination of a potential alternative based on costs of construction, operation, and maintenance; however, alternatives may be rejected because they are infeasible (Section 15126.6(a)). Feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (CEQA Guidelines §15362).

Table 3-1 on page 3-5 was modified to update distance to the Navy Depot:

Table 3-1
Pipelines that Could Service the El Segundo Refinery

Pipeline	Size, inches diameter	Capacity, thousand barrels per day	Current Available Capacity, thousand barrels per day	Notes
Line 63	14-16	95	35	Only carries oil within the Los Angeles Basin. Connects most area refineries, including El Segundo. Pier 400 connection would displace current material. Portions of the line would need to be reversed. A connection to Pier 400 would be made from Valero as part of the Pier 400 project.
Line 2000	16-20	130	80	Carries oil from San Joaquin Valley to Los Angeles Basin. A connection at Lynwood delivers oil to El Segundo to the west and Valero Refinery to the south. Connecting to Pier 400 would require reversing the portion of the line between Lynwood and Valero. The Pier 400 project would connect to Valero.
Line 93	16	95	75	Carries oil from San Joaquin Valley to Los Angeles Basin. Would require approximately four miles (6.4 km) of new pipeline. In addition, the current 75,000 bpd would be displaced
Edison Pipeline Terminal Company	12-16	100	20	Runs from El Segundo Refinery to the POLB. A connection to the POLB would need to be constructed for access to Pier 400.
Chevron 1 & 2	8	60	30	Runs from El Segundo Refinery to the Navy Depot near the POLA. Would require a new pipeline from Navy Depot to POLA (estimated ~~0.5~~3 to 4 miles [~~0.8~~5 to 7 km]).
Chevron 3 & 4	8	0	0	Pipelines have been abandoned.

Source: Chevron 2009

Text was deleted on page 3-10:

~~This alternative would decrease the risk of crude spills at the Marine Terminal. However, this risk would be shifted to vessels calling at the POLA/POLB, where spill impacts would be reduced as previously discussed.~~ Although some existing pipelines could transport some or all of the crude oil, additional pipelines and modifications to existing infrastructure between the ports and the Refinery could be necessary to satisfy large crude throughputs at the Refinery. The feasibility of permitting these pipelines is speculative and approval by relevant jurisdictions could take several years. There would also be an increased hazard associated with transporting petroleum products via pipeline. Also, the types of crude available to the Refinery from the existing terminals in the POLA/POLB are limited. Therefore, this alternative is eliminated from further consideration in the EIR.

Text was deleted on page 3-12:

Another option would use trucks to transport crude and refined products that exceed the capacity of existing pipelines through the POLA/POLB. Significant transportation of crude oil or products via truck is not physically feasible or environmentally desirable. To supply the entire amount of crude lost from the Marine Terminal and transport finished product from the Refinery to customers, at least 1,500 tanker trucks would be necessary to bring crude oil to the Refinery and carry out product each day. Trucks currently provide a small amount of ~~crude oil or~~ raw materials to the Refinery (less than 0.5 percent, or approximately 10 trucks per day); a truck terminal is available to handle current activity.

Table 3-3 was modified to include the appropriate impact class for impact AQ-1 (see discussion in Section 4.4., Air Quality):

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Section 4.4 Air Quality							
AQ-1	Exceedance of Incremental Health Risk Threshold During Project Operations	II	II	II↓	II↓	II↓	No Project could generate health risks due to other means of transportation. Berths farther away from shore would have a lower health risk impact. The lower emissions at the Pier 400 facility would reduce emission impacts. Note: increase peak day criteria emissions with berths alternatives, decreased GHG emissions within SCAB with alternatives.

1

The following text on page 3-36 was added to update the information about the Product Reliability and Optimization Project:

The proposed Chevron PRO Project was determined to be a "project" under CEQA definitions (PRC Section 21000 et seq.). The SCAQMD is the lead agency because it has primary approval authority over the Project; therefore, it prepared and certified a Final EIR pursuant to State CEQA Guidelines, Sections 15089 and 15132 (SCAQMD 2008). The addendum to the Final EIR was certified in May 2010.

4.1 SYSTEM SAFETY AND RELIABILITY

The text on page 4.1-8 was modified to update spill response capability and prebooming requirements:

Under CSLC and OSPR regulations, all offshore marine terminals are required to either (1) deploy boom, prior to transferring oil, in a specified manner to enclose the water surface surrounding the vessel or (2) provide sufficient boom appropriate for the conditions at the terminal, trained personnel, and equipment maintained in a standby condition at the berth for the duration of the entire transfer operation, so that a length of at least 600 feet (182.9 m) of boom can be deployed within 30 minutes of a spill (CSLC 1994). A bill recently vetoed by the Governor, AB 234, would have required that booming be undertaken prior to all marine oil transfer operations and periodically monitored throughout the duration. OSPR is currently updating ~~their~~its booming requirements to include pre-booming, except standby booming could be used if the transfer units successfully demonstrate to the OSPR administrator their ability to deploy and maneuver boom in an equipment deployment drill.

The text on page 4.1-16 was modified to update leak detection:

While the Marine Terminal is operating (i.e., tankers are present) ~~a pressure point analysis system is used in combination with~~ visual inspections are used to detect leaks. ~~The pressure point analysis system monitors the pipeline pressure during transfer operations and utilizes a computer algorithm to estimate a leak.~~ The working pressure of the pipelines is normally 180 pounds per square inch absolute (psia) (1.2 [megapascals [MPa]); the pressure limit is 275 psia (1.9 MPa). A separate pressure alarm is set at 240 psia (1.6 MPa). ~~A change in pressure that suggests a suspected leak sets off a system alarm. This pressure alarm is tested quarterly.~~ Crew and operations personnel ~~also~~ visually inspect the ocean area around a vessel and areas within the onshore Marine Terminal for potential leakage.

The following text was added on page 4.1-21:

The onsite fire department reportedly holds regular training sessions and drills in conjunction with the City of El Segundo Fire Department. The Refinery also is active in the Beach Cities Community Awareness and Emergency Response organization, where industry and local government agencies coordinate emergency response activities, and is a sponsor of the Community Alert Network telephone call-out system.

The text on page 4.1-22 was modified to update fire response capabilities:

In addition, a Los Angeles County Fire Department fire boat in Marina Del Rey could respond in approximately 30 minutes. Fire boats are also available from the POLA, or POLB harbors. Because the transit time from these harbors is approximately one to two hours, these fire boats would be called upon only in the event that Chevron's onsite equipment in combination with a ship's equipment is unable to control a shipboard fire. ~~In addition, a Los Angeles County Fire Department fire boat in Marina Del Rey could respond in approximately 30 minutes.~~

City of El Segundo Fire Response Capabilities

The Refinery is also served by the City of El Segundo Fire Department. The City maintains two fire stations within El Segundo. Station No. 1 is ~~normally manned with 10 personnel and is e~~quipped with two engines, one paramedic unit, and one command vehicle. ~~Eight personnel are normally on duty each day at~~ Station No. 2. ~~This station~~ has one engine, a truck and a paramedic unit. A combined 14 personnel are normally on duty each day. The City has mutual aid agreements with fire departments in the cities of Manhattan Beach, Hawthorne, Hermosa Beach, Redondo Beach, Torrance, Gardena, Inglewood, and Los Angeles.

Text was modified on pages 4.1-23 and 4.1-24 to update spill information:

Marine Terminal Spills

On March 16, 1991, the tanker *Omi Dynachem* severed a 26-inch (0.7-m) pipeline at Berth 3 of the Chevron El Segundo Marine Terminal. When the *Omi Dynachem* attempted to anchor and hook up to the mooring, a hydraulic winch failed and caused the ship to abort the attempt and weigh anchor. The mooring pipeline was severed when it was snagged by the starboard anchor. Most of the approximately 307,440 gallons (7,320 bbl) of gas-oil in the pipeline at the time of the accident were recovered in the following days~~The~~, placing the final spill size ~~was~~at ~~reported as~~ approximately

~~9,240~~21,000 gallons (~~220~~ 500 bbl). The slick reportedly extended four miles (6.4 km) and affected Malibu Creek 16 miles (25.7 km) from the Marine Terminal, but dissipated within two days (Incident News 2009). The spill led to the removal of Berth 2.

Since 1992, the CSLC has tracked oil spills from marine terminals. From 1992 to 2001, a total of 128 spills, ranging from a few teaspoons to 1,092 gallons (26 bbl), occurred at California marine terminals. This equates to approximately 13 spills per year. Terminal spills were responsible for approximately 57 percent of the spills recorded, while vessel incidents were responsible for the remaining 43 percent.

Table 4.1-3 lists the 62 reported spills at the El Segundo Marine Terminal from 1977 to 2002. Assuming the same vessel call rate over the timeframe that occurred between 2002 and 2008, this would equate to a spill rate of 8.5 spills per 1,000 vessel calls. Of the Marine Terminal spills, 58 percent of the reported spills were small, consisting of less than one gallon of spilled material. Only one major oil spill (greater than 42,000 gallons [1,000 bbl]) occurred during this 26-year period; as discussed previously, in December 1980 a ~~stress fracture~~hole in the hull of the *John McCone* resulted in the release of an estimated 105,000 gallons (2,500 bbl) of crude oil into Santa Monica Bay.

Table 4.1-3 was updated with revised information about the Omi Dynachem spill and to include additional spills:

Table 4.1-3
Chevron El Segundo Marine Terminal Historical Oil Spills

Source	Date	Berth	Spill size (gallons)	Material Spilled	Comments
Omi Dynachem	3/17/91	3	~~9,200~~21,000	Gas Oil	#91017 anchor snagged #3 berth subline while in #2 berth
Colorado	1/20/2004	3	<1	Hydraulic Oil	Sheen of oil, possible fluid from thruster valve
Pipeline	7/15/2009	3	<1	Cutter Oil	Flange discovered leaking by divers during cathodic line inspection

Text on page 4.1-32 was updated regarding the BP oil spill:

~~Although the BP spill differs from a tanker spill since it was in very deep waters, the release location was at the ocean floor, and it continued for a period of 100 days, the extent of spill impacts gives a measure to the extents that are estimated in this EIR's modeling analysis and demonstrates the extent of spill impacts.~~The BP spill differs from a potential tanker spill in several ways. Most notably, the BP spill occurred from an exploration well drilled into a pressurized oil reservoir (which acts as a relatively unlimited supply) in very deep water and the release location was the ocean floor. In contrast, a potential tanker spill would be limited to some of the material onboard since the vessel is compartmentalized to better contain and manage the cargo, or at worst case the entire volume of material on–board the vessel. In addition, a tanker release would require a breach of the double hull and would not be under pressure. Therefore, the spill response actions and the oil spill modeling associated with the BP spill are the only aspects appropriate for comparison and education relating to a tanker release.

Test was added on page 4.1-41 to include sumps:

Spill impact modeling has been conducted for offshore areas only. Spill consequences and spill volumes at the onshore areas of the Marine Terminal are a function of the length of piping and the operations, such as pumping rate. A spill at the Marine Terminal onshore areas could flow offsite and impact the beach areas or could flow into storm drains/sumps that potentially flow to the ocean or wastewater treatment facilities. A site visit to the onshore Marine Terminal areas indicated that a spill in the immediate areas around the pumps would be contained by depressed areas. However, drains/sumps in these depressed areas might flow to the environment. Areas away from the depressed pump areas are generally not bermed, and pipe leaks or ruptures in these areas could flow to the beach. Spill volumes would be a function of the pumping rates, vessel and piping volumes, and the duration a leak goes undetected. Spill volumes would be approximately 3,750 bbl (157,500 gallons) for a five-minute leak on the Berth 4 pipeline.

Text was added on page 4.1-46 to include spill response regulation information:

To be consistent with other analyses and to represent worst case conditions, no response involving containment or cleanup of the spill using mechanical or chemical (dispersant) means was assumed to occur in any of the scenarios modeled. As required by regulations, spill response efforts must occur within one hour of a spill.

Therefore, the response effort would reduce spill impacts from those presented in this analysis.

Text on page 4.1-78 was clarified:

The SPCC in these regulatory programs apply to oil storage and non-transportation facilities and terminals, tank farms, bulk plants, oil refineries, and production facilities, as well as bulk oil consumers, such as apartment houses, office buildings, schools, hospitals, farms, and state and federal facilities.

Text was added on page 4.1-82 to include spill response regulation information:

The OSPR was created within the CDFG to adopt and implement regulations and guidelines for spill prevention, response planning, and response capability. A memorandum of understanding between the CDFG and CSLC, issued on April 8, 1992, coordinates oil spill prevention and response. Final regulations regarding oil spill contingency plans for vessels and marine facilities were issued in November 1993 and last amended in October 2002 (Title 14, CCR, sections 815.01-820.01). Similar oil spill contingency plan requirements for non-tank vessels were issued in 2002 and last amended in March 2005 (14 CCR 825.01-827.02). Regulations related to oil vessel transfer operations require minimum equipment and boom vessel response times (14 CCR 844). These regulations, similar to but more comprehensive than their federal counterparts, require marine facilities and vessels demonstrate they have the necessary response capability on hand or under contract to respond to specified spill sizes including a worst case spill. The regulations also require conducting a risk and hazard analysis on each facility in accordance with hazard evaluation methods and guidelines established by the AIChE or an equivalent method (AIChE 1985, 1992). Financial responsibility requirements (Certificate of Financial Responsibility) are detailed in 14 CCR 791-797, which became effective in June 2003. California's requirement for financial responsibility is in excess of the federal requirements.

Text on page 4.1-86 was modified to clarify future operations:

The proposed Project could result in increased vessel calls to the Marine Terminal in the future. Although vessel calls could increase, the size of the vessels would not increase and the worst-case spill size would remain the same. ~~This could potentially result in spill scenarios that exceed the capabilities of the current response organizations in the area. However, c~~Current response organizations are extensive, relying not only on the capabilities of Chevron but on the Marine Spill Response

Corporation as well. The capabilities of spill response respond in the area are well developed due to the large POLA and POLB, which both also have substantial response capabilities and handle substantially more vessel traffic than the Marine Terminal. These capabilities exceed USCG and federal requirements for boom deployment timing and lengths and would be able to respond to a spill at the Marine Terminal even with an increase in vessel traffic. This impact would therefore be less than significant.

Text changes on pages 4.1-88 through 4.1-90 modify impact SSR-1 and mitigation measures SSR-1a and SSR-1b:

Impact SSR-1: Potential for Fires and Explosions

There would be a potential in the future for fires, explosions, releases of flammable or toxic materials, and other accidents at the Marine Terminal that could affect workers and public boating in the area near the berths as well as increase the frequency of spills due to explosion and fire (Significant, Class I).

Impact Discussion

The potential for fires, explosions, releases of flammable or toxic materials, or other accidents that could cause injuries, fatalities, or spills would be primarily associated with the flammable vapors and other flammable materials transported as cargo by tankers visiting the Marine Terminal. All tankers greater than a given size, as required by 46 CFR 32.53, ~~Only an estimated 50 percent of tankers~~ utilize gas blanketing systems, which substantially reduce the risk of fire and explosions by eliminating the availability of flammable vapors within the concentrations that could allow ignition. Vessels lacking this technology primarily present this risk. A potential increase in vessel traffic at the Marine Terminal would further increase the risks (by increasing the frequency) of fires and explosions. The thermal footprint would not change under the proposed Project since larger vessels are not anticipated to visit the Marine Terminal. This would be considered a significant impact.

Mitigation Measures

The potential for fires and explosions at the Marine Terminal can be mitigated by instituting measures to reduce the probability of an event and to reduce the impacts if they do occur.

SSR-1a. Inert Gas Systems and Fire Response. The Applicant shall extend the use of inert gas to all vessels (tankers and barges), if the California State Lands Commission (CSLC) Marine Facilities Division staff deems it feasible, that carry non-grade E cargo, to reduce the possibility of fires and explosions. The inert gas systems shall be in accordance with Title 46 of the Code of Federal Regulations Section 32.53. ~~Monitoring shall ensure that oxygen is below 8 percent by volume.~~ Response planning documents shall address response equipment and fire boats that would respond to a fire at the offshore location. These documents shall be completed and submitted to the CSLC staff within one year of lease ~~renewal~~ approval and reports submitted to CSLC staff when changes are required to the document~~annually thereafter~~. The Applicant shall conduct biennial, or more frequently as needed, fire and response drills with the El Segundo Fire Department as part of its emergency response preparedness training.

SSR-1b. Lease Modifications. The lease for the facility shall contain a clause allowing the California State Lands Commission (CSLC) to add or modify mitigation measures in the event that cost-effective technologies become available that would significantly improve protection from fires or explosions if they could be readily implemented during the lease term, as defined by "best achievable technology" (PRC section 8750(d)). Modifications should be made if a fire or explosion occurs during the lease term to take advantage of lessons learned. Annual reports shall be submitted to CSLC staff identifying any lease modifications.

Rationale for Mitigation

Applying an inert gas system to all vessels would substantially reduce the frequency of a fire or explosion that could lead to personnel or public injuries, fatalities, or a spill. Although the risks of fire and explosions would not be eliminated, inert gas systems would reduce the frequency of these types of events by a substantial margin. Note that the POLA implemented requirements against the venting of all hydrocarbons because of previous incidents that involved explosions and fires from cargo and fuel vapors. The IMO requires an inert gas system on all new tankers and most existing tankers 20,000 DWT and heavier (approximately 150,000 bbl) (IMO 2009). Federal requirements (46 CFR 32.53) mandate inert gas systems on certain crude and product tankers above a given size and age that carry non-Grade E cargos. Grade E cargos are combustible

liquids with an open cup flash point of 150°F (65.5°C) or higher. Common Grade E cargoes include No.6 fuel oil, asphalt, lubricating oil, animal and vegetable oils, and oily waste~~-~~water. Even with these federal requirements, a number of vessels (tankers and barges) that visit the Marine Terminal do not use inert gas systems.

It is important that the CSLC have the ability to impose additional requirements that could make the transfer of cargo between the facility and the vessel safer during the period of the lease. Improvements in technology and equipment are likely to occur in the next 30 years and the CSLC shall be able to require improved equipment, as it becomes available, to lessen the threat of fires, explosions, and leaks from these operations.

Residual Impacts

Implementing the inert gas blanketing mitigation measures on all vessels would substantially reduce the frequency of fires and explosions to less than the frequency associated with current operations. However, there would still remain the potential for risk of impacts to public safety from a fire or explosion and impacts would be significant (Class I).

Text changes on pages 4.1-90 through 4.1-98 modify impact discussion on SSR-2 and mitigation measures SSR-2a through SSR-2k and the rationale for mitigation:

Impact SSR-2: Potential for Spills

The potential for spills at the Marine Terminal or while vessels are in transit exists with the continued operations at the Marine Terminal (Significant, Class I).

Impact Discussion

The worst-case vessel traffic analysis presented in Section 2.0, Project Description, indicates a potential increase in vessel calls to the Marine Terminal by the year 2040. Spill risks are based on both the number of vessel calls (the spill frequency) and the ~~amount~~ worst-case spill size~~of material handled, both of which potentially could increase in the future~~. The frequency of a spill could increase with an increase in vessel calls. However, since the vessel sizes would not increase, the worst-case spill size would be the same as the current baseline operations and the modeling analysis presented would be the same under the proposed Project as the current baseline operations. Although many of the spills at the Marine Terminal are small, continued vessel traffic would

continue to present the potential for spills to the ocean. This would be a significant impact.

Mitigation Measures

Implementing mitigation measures could reduce the frequency of spills or the resulting impact of spills by decreasing detection time and increasing response capabilities.

SSR-2a. Pipeline Vacuum System. The Applicant shall ensure that the pipeline vacuum system is operational and able to function at all times when the Marine Terminal is not loading. This shall be conducted within one year of lease ~~renewal~~ approval and report~~ed~~s ~~submitted~~ to California State Lands Commission (CSLC) staff ~~annually thereafter~~.

SSR-2b. ~~Pressure Point Analysis~~Pipeline Testing System. The Applicant shall ensure that the following activities accompany all vessel and barge loading and unloading operations and that these measures are incorporated in the emergency response plans, terminal operations plans, and vessel transfer procedures, as applicable:

1. The pipeline and hoses shall be pressure tested three times during each cargo transfer: once before the vessel or barge is connected; once after the vessel or barge is connected; and once after the vessel or barge is disconnected from the pipeline. Each pipeline shall be additionally pressure-checked monthly.

2. If the pressure cannot be maintained once the pipeline is pressured, the system shall be placed under a vacuum and divers shall be mobilized to investigate the possible leak.

3. A line boat and tug shall be at the berth during all transfer operations to visually monitor for leaks.

4. A boat at the berth shall be equipped with at least 600 feet of boom for rapid response to a spill. Periodic drills shall be performed to demonstrate the ability to deploy and maneuver boom to the satisfaction of California State Lands Commission staff and Office of Spill Prevention and Response.

~~re-assess the pressure point analysis system to ensure that it is utilizing the most recent technologies, including pressure sensor accuracy and maintenance and testing, sensor location, and pressure point analysis software, and is designed to detect pressure anomalies during loading operations. This shall be conducted within one year of lease renewal and reports submitted to CSLC annually thereafter.~~

SSR-2c. Testing of ~~Spill Mitigation~~Leak Detection Equipment. Within one year of lease issuance and annually thereafter, ~~T~~the Applicant shall ~~conduct periodic (at least annual) testing of~~ the ~~vacuum and pressure point~~leak detection systems (including the vacuum system and systems to detect leaks while loading) ~~analysis~~ by utilizing by-pass valves, or other equivalent methods, to verify the function of these systems and to make adjustments as needed. ~~This shall be conducted within one year of lease renewal and~~ Test reports shall be submitted to ~~CSLC~~ California State Lands Commission staff annually~~annually thereafter~~ and shall include a discussion as to whether the system is using the most recent technology.

SSR-2d. Pipeline Leak Detection. Within one year of lease ~~renewal~~approval, the Applicant shall ensure a leak detection system is in place during all transfer operations that can detect a leak of two percent of the flow rate within five minutes. This could involve installing flow meters at both the shipping end and the receiving end of the loading pipelines ~~are equipped with flow meters~~ that utilize a means of conducting automatic and continuous flow balancing, a pressure-type system, or other equivalent methods ~~to an accuracy of at least two percent of maximum design flow rate within five minutes~~. Any deviations shall activate an alarm system at both the shipping and receiving locations. ~~The system shall be tested at least annually by utilizing by-pass valves, or other equivalent methods, to assess the capability of the leak detection systems. Annual reports shall be submitted to CSLC.~~

SSR-2e. Double Hulled Vessels. During the term of the 30-year lease, all vessels that call at the Marine Terminal shall be double hulled.

SSR-2f. Pipeline Inspections. In addition to periodic inspections and surveys, within one year of lease ~~renewal~~approval, the Applicant shall implement smart-pig inspections, cathodic inspections of the entire pipelines,

bathymetric surveys and visual inspections (either remote-operated-vehicle or camera-equipped diver to ensure a record of the inspection) ~~inspections~~ of all Marine Terminal pipelines. ~~This would require modifying some existing pipelines to allow smart pigs to pass through all pipelines.~~ The entire pipeline route and berths ~~should~~ shall be visually inspected ~~,~~ and bathymetric surveys conducted, at least every three years ~~or~~ and after major winter storms. At a minimum, ~~V~~visual surveys shall inspect ~~a minimum of~~ unsupported ~~spans~~free spans and vortex shedding, anchors and mooring lines, and other anomalies. The cathodic protection testing should be conducted per National Association of Corrosion Engineers SRP0169 ~~and API570~~. Close interval cathodic protection testing should be conducted every three to five years to ensure that the cathodic protection system is operating correctly throughout the entire length of all the pipelines (onshore and offshore). Smart-pigging shall be conducted every three years or to the satisfaction of the California State Lands Commission (CSLC) staff. Written results of each inspection in the form of a report shall be submitted to the CSLC staff ~~annually~~ and pipelines repaired as necessary.

SSR-2g. Bow Tube and Thruster Leaks. During the term of the 30-year lease, the Applicant shall implement techniques to detect bow tube and thruster leaks for all vessels.

SSR-2h. Motor Operated Valve System. During the term of the 30-year lease, the Applicant shall ensure that the motor operated valve (MOV) control system is reliable through testing and maintenance procedures, as indicated in past process hazards reports, and the results of testing shall be submitted to the California State Lands Commission staff annually.

SSR-2i. Automatic Identification System Shipboard Equipment. During the term of the 30-year lease, all vessels calling at the Marine Terminal shall be equipped with shipboard automatic identification system (AIS) equipment.

SSR-2j. Berm and Drainage at Onshore Marine Terminal. The Applicant shall install drain/sump protection in the form of sealable coverings, valves, drainage procedures, or another methods to prevent flow of spilled oil through the drains/sumps at the onshore areas of the Marine Terminal to

the environment. The drain/sump protection would prevent a spill of material at the loading pumps or other Marine Terminal equipment from entering the drains/sumps and thereafter affecting the ocean. All areas of the onshore Marine Terminal shall be protected by berms that can contain a worst-case discharge from the pumps or pipelines, including potential drain-down from Refinery tankage. Onshore pipelines shall be protected from vehicle impacts. These protections shall occur within one year of lease ~~renewal~~ approval and a report~~s~~ shall be submitted to California State Lands Commission staff~~CSLC~~, ~~–~~including drain/sump descriptions and measures taken and a survey of the onshore areas with spill capture volumes ~~annually thereafter~~.

SSR-2k. Pipeline Maintenance. Within one year of lease ~~renewal~~approval, the Applicant shall ensure that the recommendations from all previous hazard and operability studies and the cathodic protection system reports are implemented~~, specifically the use of dielectric fittings, periodic offshore cathodic protection surveys and potentials, replacement of deep well anodes as necessary, monthly readings of rectifier current and voltage, inspection of the pipeline casings related to cathodic potential and corrosion, and periodic onshore and offshore inspection of pipeline systems by corrosion engineers~~. HAZOP studies shall be updated as required by the EPA or OSHA and reports submitted to California State Lands Commission staff ~~CSLC annually~~.

Rationale for Mitigation

The vacuum leak detection system is used when the Marine Terminal pipelines are not loading or unloading materials. The system operates by applying a slight vacuum on the pipelines when they are not in use. If a leak develops in the pipeline while the vacuum is applied, the system would not be able to maintain a vacuum and an alarm would sound. According to the 2005 PHA, the vacuum leak detection system~~s~~ required some troubleshooting and was not operational. Ensuring that the system is continuously operational would ensure quick detection of leaks and a response to minimize the size of a leak and the extent of potential damage.

Conducting pressure tests on the pipeline before and after each transfer operation would help ensure the integrity of the pipeline is intact before each transfer. Chevron

indicates that they currently do this; however, it does not appear to be a requirement and is therefore recommended as a mitigation measure.

Pre-booming vessels while at the El Segundo Marine Terminal during on- and off-loading is not practical for several reasons. While a ship is in the moorings, eight mooring lines run from the ship to eight mooring buoys to hold the ship in place. The buoys are in a circular pattern around the ship, each approximately 500 feet from the ship. It is not possible to encircle the ship while it is tied up in the moorings since the mooring lines from the buoys to the ship would interfere with the boom boat. A boom boat cannot run under the mooring lines to deploy the boom. The Applicant would have to deploy the boom outside the buoys to pre-boom and encircle the ship, which would require an approximately 4,700-foot circle of boom.

In addition to the long length of boom, pre-booming outside the mooring lines would create problems. Wind, seas, swell and current would prevent the boom from remaining in place around the buoys. Moreover, if swell or wind increased, the boom could jump over the buoys, entangling the boom and mooring lines and rendering the boom useless. Oil containment boom is not designed to rub up against mooring buoys, which would be inevitable even in calm weather. Booming outside the mooring lines would damage the boom and it would be ineffective in containing spilled oil.

Weather, wind seas, swell, and current are constantly changing and impact every ship that comes into the mooring differently. In the event of a spill, response operations need flexibility and the option to move resources to adjust to these changing conditions. Mooring at the Marine Terminal is completely different from mooring inside a harbor at a facility where pre-booming is required and makes sense from a spill response viewpoint. Currents, open ocean swells, and wind are not relevant in the harbor, and oil boom can be secured around the ship. In that case pre-booming can be done safely and is effective in containing spilled oil.

However, a boat equipped with a boom at the berth location, instead of in Marina Del Rey or King Harbor, would allow quicker booming and response times. The boom could be on one of the tugs or line boats that would provide visual inspections during transfer operations. Six-hundred feet of boom, the minimum required by 14 CCR 844 and OSPR, would enable effective response to small spills. For larger spills, booms are available on response vessels in Marina Del Rey and King Harbor, at the Chevron Refinery, and at the POLA/POLB.

The pressure point analysis (PPA) system described by Chevron in its Application operates by monitoring pressures at different points in the pipeline systems. The current PPA system was installed several years ago and has, as recently reported by Chevron, been ineffective due to variations in flows associated with normal transfer operations. More refined techniques or installing additional pressure sensors, or different types of pressure sensors, and flow information might increase system response and improve effectiveness. The system should be thoroughly redesigned with new equipment, such as flow meters or other equivalent devices, ~~evaluated to assess the current abilities of the PPA system and whether any upgrades are necessary~~to ensure a leak during transfer operations could be detected at a given level of accuracy. Ensuring that the system is as efficient as possible would ensure quick detection of leaks and a response to minimize the size of a leak and the extent of potential damage.

Leak detection systems should be periodically tested to ensure they function as necessary. This should involve testing actual components with a leak simulation by opening bypass systems to reduce the flow or pressure at various points in the system, for example. Guaranteeing leak detection systems are operating would ensure quick detection of leaks and a response to minimize the size of a leak and the extent of potential damage.

Numerous onshore and offshore pipeline systems utilize supervisory control and data acquisition flow balancing to ensure that small leaks are detectable. By continuously monitoring flows into and out of a system and comparing total flows, this balancing system ensures that no loss occurs. The Marine Terminal currently conducts this type of comparison; however, the Terminal only periodically uses manual ~~dipstick-style~~ tank-measuring devices during the transfer process. The current system could provide the required accuracy (MOTEMS specifies a two percent accuracy over five minutes), but may need to be upgraded for more continuous or frequent monitoring. Continuously ensuring all materials leaving a vessel are actually received at the onshore tank farm would guarantee quick detection of leaks and a response to minimize the size of a leak and the extent of potential damage. In addition, when vessel loading times extend into nighttime or the area is foggy with reduced visibility, a leak detection system that does not rely on visual inspection could substantially reduce the response time to a leak.

Current regulations require replacement or conversion to double-hulled configuration of large tankers by 2010 and smaller tanker barges barge by 2015. Data from the USDOT indicate that more than 80 percent of crude and product tankers that call at U.S. ports were double hulled in 2007. Chevron indicates that more than 90 percent of vessels

that call at the Marine Terminal are double hulled. Double-hulled vessels have a lower frequency of spills because of the added protection of the double hull provides in a grounding, collision, allision, or bottom puncture. Data from the Federal Emergency Management Agency indicate that larger spills occur five times less frequently for double-hulled vessels than for single-hulled vessels (FEMA 1989). Studies conducted to assess the effectiveness of OPA 90 indicate that "in the event of an accident involving a collision or grounding, an effectively designed double-hull tanker will significantly reduce the expected outflow of oil compared to that from a single-hull vessel" (including barges) (Marine Board 1998a). As a note, the study did not find this to be true of double-hulled vessels with single-tank-across cargo tank configurations.

The USCG Programmatic Regulatory Assessment evaluated the effectiveness of double hull requirements (USCG 2001). Overall, the assessment found that double-hull requirements will reduce the number of spills for tankers and barges by 13 percent and 16 percent and the volume of oil spilled by 21 percent and 22 percent in the future, respectively.

Requiring all tankers, including larger vessels and smaller barges, to convert to double hulls before required by regulations would reduce the risk of an oil spill.

Smart-pig technology involves passing a device through a pipeline. The device, the smart pig, is equipped with sensors that detect corrosion, dents, cracks, and other potential defects in a pipeline. Smart pigs enable early detection of situations that could lead to a pipeline spill. Smart pigs currently inspect some Marine Terminal pipelines. The Berth 3B main pipeline was most recently inspected in September 2005. Smart pigs cannot inspect the 14-inch (35.6-cm) pipeline to Berth 4 because bends in the pipeline prevent the pig's passage; the pipeline would need to be modified to be inspected by smart pigs. Regularly smart-pigging all the pipelines would reduce the frequency of spills from pipeline defects.

The 2005 PHA determined that there currently is not a method to detect leaks from vessel bow tubes and thrusters. Implementing a method, through booming or other detection technique, would reduce the frequency of spills from bow tubes and thrusters.

Vessels carrying Alaska crude oil from Alaska are equipped with required AIS. This equipment automatically relays the vessels position and traveling information to the VTIS. This enables the VTIS to use AIS instead of radar, which can be less accurate in some conditions, including inclement weather. Requiring all vessels that call at the Marine Terminal to carry AIS equipment would reduce the frequency of vessel

collisions, allijusions, and grounding by ensuring the VTIS has accurate information on vessel positions at all times.

A spill at the onshore area of the Marine Terminal could drain to the ocean through existing area drains/sumps or directly over the ground surface to the beach area. Ensuring that all drains/sumps are protected in the event of a spill and that any spill from pipelines or equipment would be contained within berms would decrease the frequency of uncontained spills at the onshore Marine Terminal location.

The 2008 cathodic protection surveys on the Marine Terminal recommendations are listed in the mitigation measure (Farwest 2008). However, the offshore pipelines have not been assessed for cathodic protection. Implementing the recommendations and surveying the offshore pipelines would reduce the frequency of pipeline spills and enhance the preventative maintenance of the pipeline and terminal systems.

Since numerous reporting requirements are associated with the maintenance and testing mitigation measures, a reporting program should be developed that includes one-time and annual status reporting. A one-time report should be submitted within one year of lease ~~renewal~~approval addressing the status of the following items:

- The pipeline vacuum system, design, and operations, including setpoints and alarms;
- Loading procedure updates to the emergency response plans, the terminal operations manual, and the vessel transfer procedures;
- The transfer operations leak detection system design and operations, including setpoints and alarms;
- Bow and tube thruster detection technique description;
- Drain/sump design and discharge measures and procedures to prevent spills from reaching the environment; and
- Status of all past HAZOP and cathodic protection survey recommendations.

In addition, testing results should be compiled into an annual submission containing at least the following:

- Vacuum leak detection testing results;
- Transfer leak detection testing results;
- Drill reports associated with boom deployment drills;

- The results of smart-pig inspection, cathodic inspections, visual inspections, and bathymetric inspections and a description of any repairs or modification to equipment or procedures as a result of the testing; and
- The results of MOV and shutdown system tests.

Residual Impacts

Although the measures discussed would reduce the severity and the frequency of spills from the Marine Terminal future operations, the possibility of a spill would remain. Therefore impacts would be significant (Class I).

Mitigation measure SSR-3 on page 4.1-98 was modified:

Mitigation Measure

SSR-3. Sampling Program for Sediments Within the Proposed Project. ~~60~~ Sixty days prior to the start of any major planned offshore construction (ongoing during construction, as applicable, but excluding routine inspection, maintenance, and repair) ~~and prior to conducting any offshore activities~~ that would disturb sediments, the nature of potential contamination within these sediments shall be defined. Samples should be collected and analyzed, and results summarized in a report to the California State Lands Commission staff ~~and other interested parties~~. This report should include, at a minimum, recommendations to minimize disruption of any identified contaminated sediments, including removal if necessary. Sediments disturbed during construction found to be contaminated shall be appropriately managed~~treated~~ prior to conducting any offshore activities.

Table 4.1-16 was updated to include the revised mitigation measures:

Table 4.1-16
Summary of System Safety and Reliability Impacts and Mitigation Measures
Proposed Project

Impact	Mitigation Measures
SSR-1: Potential for Fires and Explosions	**SSR-1a.** Inert Gas Systems and Fire Response **SSR-1b.** Lease Modifications
SSR-2: Potential for Spills	**SSR-2a.** Pipeline Vacuum ~~Leak~~ System ~~Detection~~ **SSR-2b.** ~~Pressure Point Analysis~~Pipeline Testing System **SSR-2c.** Testing of Leak Detection ~~Systems~~ Equipment **SSR-2d.** Pipeline Leak Detection **SSR-2e.** Double Hulled Vessels **SSR-2f.** Pipeline~~Smart-Pig~~ Inspections **SSR-2g.** Bow Tub and Thruster Leaks **SSR-2h.** Motor Operated Valve System **SSR-2i.** Automatic Identification System Shipboard Equipment **SSR-2j.** Berm and Drainage at Onshore Marine Terminal **SSR-2k.** Pipeline Maintenance.
SSR-3: Disturbance of Potentially Contaminated Seafloor Sediments	**SSR-3.** Sampling Program for Sediments Within the Proposed Project

4.2 WATER AND SEDIMENT QUALITY

The following text on pages 4.2-58 and 4.2-59 was modified:

Refinery Wastewater Discharge Permit

The LARWQCB issued an ~~industrial waste~~NPDES discharge permit (NO. CA0000337, CI-1603) to the Refinery on ~~January 13, 2007~~December 21, 2006 (LARWQCB 2006). It is valid for five years and allows the Refinery to discharge to the waters of Santa Monica Bay. As described in that NPDES permit, the Refinery's treatment plant discharges an average of 7 MGD of treated wastewater, with peak flows up to 8.8 MGD during dry weather and up to 27 MGD during wet weather. Wastewater consists of 6.45 MGD of

Refinery process water, up to 2.34 MGD of petroleum-hydrocarbon-contaminated shallow-well groundwater, 4 MGD from other intermittent sources, and 14 MGD of rainfall runoff that may be contaminated. As part of the discharge-permit requirements, the Refinery established a monitoring and reporting program to ensure compliance with the discharge limitations stipulated in the permit.

4.3 BIOLOGICAL RESOURCES

Text on page 4.3-115 was modified to correct a typo within the turtles subsection:

Although marine turtles are not commonly encountered in the area of the proposed Project, oil spill impacts to marine turtles are considered to be ~~adverse and potentially~~ significant (Class ~~I~~I) because of their threatened and endangered status.

Mitigation measures BIO-1a and BIO-1b were modified on pages 4.3-116 and 4.3-117:

Mitigation Measures

BIO-1a. Update the Oil Spill Contingency Plan to Reflect the Project Changes. The Applicant shall update the Oil Spill Contingency Plan to incorporate changes in activities that result from the proposed Project. The revised plan shall be approved by the California Department of Fish and Game (CDFG) Office of Spill Prevention and Response (OSPR) and submitted to California State Lands Commission (CSLC) staff within one year of lease ~~renewal~~ approval ~~and~~ with annual ~~submit~~ reports submitted to CSLC staff thereafter~~to CSLC annually thereafter~~. ~~For example, the~~The plan shall incorporate detailed response procedures for marine oil spills resulting from vessel groundings or collisions, as well as for pipeline failure and failures occurring during transfer of the oil to and from the barge. Worst-case discharge scenarios shall be updated accordingly. In addition, lessons learned from the response and cleanup of the 1997 Platform Irene or 2010 Deepwater Horizon oil spills shall be incorporated into the Response Plan. ~~These lessons include operator training in recognizing the significance of deviations in pipeline operating parameters, inspections required to restarting equipment that automatically shuts down in response to a process deviation, and rapidly implementing surveillance activities following process deviations to determine if a spill has occurred.~~

The personnel and training sections of the Oil Spill Contingency Plan shall be updated and identify training requirements for all personnel that would

be utilized to respond to oil spills. At a minimum, new personnel shall be trained immediately upon their hiring in the overall operational aspects of oil spill response, including the proper use of all equipment that would be utilized in oil spill response. Annual training for all personnel, which is a Federal requirement, shall also be included in the Oil Spill Contingency Plan to provide personnel with an understanding of their training responsibilities. The annual training shall include training in the operation of new equipment that may be utilized in oil spill response, retraining in the operation of existing equipment, and review of the oil spill response requirements that are identified in the Oil Spill Contingency Plan.

BIO-1b. Vessels That Call on the Terminal Shall Implement Their Own Oil Spill Response Plan. The Applicant shall revise its Vessel Pre-Arrival Questionnaire for all arriving vessels to verify compliance with the requirements of 33 CFR 155, Subpart D. The Vessel Pre-Arrival Questionnaire shall require the vessel operator to provide the date and document number of the approved Oil Spill Response Plan, the plan to be available onboard, and specific elements of the response plans be complete, including but not limited to:

1. Procedures to mitigate suspected cargo tank or hull leaks and spills associated with cargo transfers, including transfer system leaks and tank overflow;

2. Procedures related to grounding and collisions, explosions, fire, hull failures, excessive list, or equipment failure;

3. Procedures for the crew to deploy discharge-removal equipment; and

4. The status and availability of discharge-removal equipment.~~This plan shall comply with 33 Code of Federal Regulations 155, Subpart D and shall be submitted within one year of lease renewal and reports submitted to CSLC annually thereafter.~~

Text modifications on pages 4.3-128 through 4.3-131 updated impact BIO-3 and mitigation measure BIO-3a and removed mitigation measure BIO-3b, and enhanced the residual impact discussion:

Because of their feeding behavior, gray whales also have the potential to come into contact with a bottom cable. Although feeding has been only occasionally observed off coastal California during migration, their more leisurely northbound return probably ~~i~~involves feeding (Leatherwood et al. 1987). When feeding on benthic infauna off British Columbia, Oliver et al. (1984) reported that excavations created during furrowing through sediments ranged from six to 10 inches (15 to 25 cm) in depth. Benthic suction feeding by gray whales has also been reported by others including Nerini (1984), Ray and Scheville (1974), Nelson et al. (1983), Nerini and Oliver (1983) and Thomson and Morin (1984). Hence, during feeding on benthic infauna, entanglements with cable are possible~~, should cables or pipelines be exposed or buried to insufficient depths~~. Entanglement impacts to other marine mammals, such as pinnipeds and fissipeds, are not expected to occur.

Although entanglement with a single cable is unlikely, an unburied cable, or one that is suspended high off the seafloor would increase the likelihood of a collision and possible entanglement. A collision with a suspended or unburied cable is also possible during active feeding frenzies or other instances requiring quick maneuvers.

Mitigation Measures

In order to avoid causing disturbance, injury or death to protected marine species (e.g., endangered and threatened species, and marine mammals) the following measures should be taken when consistent with safe navigation:

BIO-3~~a~~. Marine Mammal and Turtle Contingency Plan. The Applicant shall ensure that ~~vessel operators develop and implement~~ a contingency plan is developed and implemented for all vessel operators utilizing the Marine Terminal (including tankers, line boats, and launches) that focuses on recognition and avoidance procedures when marine mammals and turtles are encountered ~~at sea~~within 12 nautical miles of the California shoreline. The plan shall be submitted within one year of lease ~~renewal~~ approval and reports shall be submitted to ~~CSLC~~ California State Lands Commission staff annually thereafter. Minimum components of the plan include:

1. Existing and new vessel operators shall be trained by a marine mammal expert to recognize and avoid marine mammals and turtles prior to Project-related activities. Training sessions shall focus on the identification of marine mammal and turtle species, the specific behaviors of species common to the Project area and transport

routes, and awareness of seasonal concentrations of marine mammal and turtle species. The operators shall ~~be re-trained~~complete refresher training annually.

2. A minimum of two ~~marine mammal~~ observers shall be placed on all support vessels during the spring and fall gray whale migration periods (generally December through May), and during periods/seasons when other marine mammals, such as migrating fin, blue, and humpback whales (generally June through November), are known to be in the Project area in relatively large numbers. Observers can include the vessel operator and/or crew members, as well as any Project worker that has received proper training. Vessel operators and crews shall maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species.

3. Vessel operators will make every effort to maintain a distance of 1,000 feet (305 m) from sighted whales, and~~–~~ 150 feet (45.7 m) or greater from sea turtles or smaller cetaceans whenever possible.

4. When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), vessel operators shall attempt to remain parallel to the animal's course. When paralleling whales, supply vessels will operate at a constant speed that is not faster than the whales' and shall avoid excessive speed or abrupt changes in direction until the cetacean has left the area.

5. Per NOAA recommendations, and when safety permits (i.e., excluding during poor sea and weather conditions, thereby ensuring safe vessel maneuverability under those special conditions) vessel speeds shall not exceed 11.5 mph (10 knots) when mother/calf pairs, groups, or large assemblages of cetaceans (greater than five ~~in number~~individuals) are observed near an underway vessel. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures, such as decreasing speed and avoiding sudden changes in direction, should always be exercised. The vessel should ~~attempt to~~ route around the animals, maintaining a minimum distance of 300 feet (91.4 m) whenever possible.

6. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, operators will reduce speed and shift the engine to neutral. Vessel operators will not engage the engines until the animals are clear of the area.

7. Support vessels shall not cross directly in front of migrating whales, other threatened or endangered marine mammals, or marine turtles.

8. Support vessels shall not separate female whales from their calves.

9. Vessel operators will not herd or drive whales.

10. If a whale engages in evasive or defensive action, support vessels will drop back until the animal moves out of the area.

11. Collisions with marine wildlife will be reported promptly to the Federal and state agencies listed below pursuant to each agency's reporting procedures.

National Marine Fisheries Service
Southwest Region, Stranding Coordinator~~, Southeast Region (currently, Joe Cordaro)~~
~~National Marine Fisheries Service~~
Long Beach, CA 90802-4213
(~~310~~562) 980-4017

~~Enforcement Dispatch Desk~~
California Department of Fish and Game
Enforcement Dispatch Desk
Long Beach, CA 90802
(562) 590-5132 or (562) 590-5133

California State Lands Commission
Environmental Planning and Management Division
Sacramento, CA 95825-8202
(916) 574-1900

~~**BIO-3b. Burial of Pipelines.** Burial of subsea pipelines and cables to a depth of 3.28 feet (1 m) except where precluded by seafloor substrates. A 3.28~~

~~feet (1 m) burial depth would sufficiently protect gray whales foraging in bottom sediments on their northbound migration. It is understood that this burial depth may not be achieved in areas where there is localized, higher sediment resistance, or substantial variations in bottom slope or cable ship speed; however, such locations should be documented and monitored during regular inspection surveys. If, during inspection, sections of the cable or pipeline are found to be exposed contrary to the original as-built burial configurations, remedial actions will be taken within 60 days to re-bury the lines. Specific actions shall be pre-approved by CSLC staff. This mitigation measure shall occur 60 days prior to the start of any construction and shall be ongoing during construction (as applicable).~~

Rationale for Mitigation

Avoidance of marine mammals and turtles can be facilitated through training and education of vessel operators as to recognize, understand, and minimize conflict with marine species. Implementation of the marine mammal/turtle observer requirement and the proposed speed limitation would substantially reduce the potential for adverse impacts to marine mammals and turtles.

Residual Impacts

Implementation of **MM BIO-3a** ~~and **BIO-3b**~~ would substantially reduce the potential for adverse impacts to marine mammals and turtles below baseline conditions,~~. This~~; however this would still be a potentially significant, but mitigable impact (Class II).

Modifications on pages 4.3-132 and 4.3-133 updated impact BIO-4 and mitigation measure BIO-4:

Similarly, any restrictions on fishing due to construction activities, such as for replacement of the pipelines to the berths, are likely to be localized and temporary. Pipeline replacements are expected to take approximately one to two months. However, the replacement of the pipelines to the berths does not currently indicate whether these lines will be buried or lie above the seafloor substrate. Unburied cable or pipelines have the potential to snag fishing gear in the Project area. In 1991, a mooring accident involving the tanker vessel *Omi Dynachem* occurred when a vessel anchor became hooked on a 26-inch (66.0-cm) undersea pipeline, severing it. The incident resulted in a spill of ~~more than~~approximately ~~27~~21,000 gallons (500 ~~bbls~~) of gas-oil to the marine environment.

Mitigation Measures

BIO-4. Use Designated Marine Traffic Corridors. Support and tankering vessels shall use designated traffic corridors where possible during the term of the 30-year lease.

~~Similarly, implementation of measure **MM BIO-3b** would minimize risks to fishing gear from snagging or entanglement.~~

Rationale for Mitigation

MM BIO-4 would minimize potential disputes over vessel right of way. ~~**MM BIO-3b,** which requires burial of pipelines for the protection of foraging whales, would also minimize potential snagging by fishing gear.~~ With implementation of ~~these~~ this measure~~s~~, the risk to the marine environment and impacts to commercial and recreational fishing would be potentially significant (Class II).

Mitigation measure BIO-5 was modified on pages 4.3-136 through 4.3-138:

BIO-5. Update the Oil Spill Contingency Plan to Protect Sensitive Resources. The Oil Spill Contingency Plans (OSCP) shall be revised and updated to address protection of sensitive biological resources and revegetation of any areas disturbed during an oil spill from the proposed pipeline or cleanup activities. The updated OSCP shall be submitted within one year of lease ~~renewal~~ approval and reports submitted to California State Land Commission (CSLC) staff annually thereafter. The revised OSCP shall, at a minimum, include:

1. Specific measures to avoid impacts on Federal- and State-listed endangered and threatened species and Environmentally Sensitive Habitat Areas during response and cleanup operations. Where feasible, low-impact, site-specific techniques such as hand-cutting contaminated vegetation and using low-pressure water flushing from vessels to remove spilled material from particularly sensitive wildlife habitats, such as coastal estuaries, i.e., Ballona Wetlands, because procedures such as shoveling, bulldozing, raking, and drag-lining can cause more damage to a sensitive habitat than the oil spill itself. The OSCP shall also evaluate the non-cleanup option for ecologically vulnerable habitats such as coastal estuaries.

2. Specific measures requiring spill response personnel to be adequately trained for response in terrestrial environments and spill containment and recovery equipment to be maintained in full readiness. Inspection of equipment and periodic drills shall be conducted at least annually and the results evaluated so that spill response personnel are familiar with the equipment and with the Project area including sensitive onshore biological resources.

3. When habitat disturbance cannot be avoided, stipulations for development and implementation of site-specific habitat restoration plans and other site-specific and species-specific measures appropriate for mitigating impacts on local populations of sensitive wildlife species and to restore native plant and animal communities to pre-spill conditions. Access and egress points, staging areas, and material stockpile areas that avoid sensitive habitat areas shall be identified. The OSCP shall include species- and site-specific procedures for collection, transportation and treatment of oiled wildlife, particularly for sensitive species.

4. Procedures for timely re-establishment of vegetation that replicates the habitats disturbed (or, in the case of disturbed habitats dominated by non-native species, replaces them with suitable native species) including: measures preventing invasion and/or spread of invasive or undesired plant species; restoration of wildlife habitat; restoration of native communities and native plant species propagated from local genetic sources including any sensitive plant species (such as the southern tarplant); and replacement of trees at the appropriate rate.

5. Monitoring procedures and success criteria to be satisfied for restoration areas. The success criteria shall consider the level of disturbance and condition of the adjacent habitats. Monitoring shall continue for three to five years, depending on habitat, or until the success criteria are met. Appropriate remedial measures, such as replanting, erosion control or control of invasive plant species, shall be identified and implemented if it is determined that the success criteria are not being met.

6. The OSCP shall follow all the applicable portions of the Area Contingency Plan and National Contingency Plan under guidance from the appropriate lead agency (e.g., Office of Spill Response and Prevention).

Table 4.3-12 on page 4.3-139 was modified to remove mitigation measure BIO-3b:

Table 4.3-12
Summary of Biological Resources Impacts and Mitigation Measures
Proposed Project

Impact	Mitigation Measures
BIO-1: Oil Spill Impacts to Marine Biological Resources	**BIO-1a.** Updating the Oil Spill Contingency Plan to Reflect the Project Changes **BIO-1b**. Vessels That Call on the Terminal Shall Implement Their Own Oil Spill Response Plan **SSR-2.**
BIO-2: Oil Spill Impacts to Commercial and Recreational Fishing	**BIO-1a**, **BIO-1b**, and **SSR-2 through SSR-2K.**
BIO-3: Vessel Traffic and Construction Impacts on Biological Resources	**BIO-3a.** Marine Mammal Contingency Plan ~~**BIO-3b**. Burial of Pipelines~~
BIO-4: Vessel Traffic and Marine Construction Impacts on Commercial and Recreational Fishing.	~~**BIO 3b**. Burial of Pipelines~~ **BIO 4.** Use Designated Marine Traffic Corridors
BIO-5: Oil spill Impacts to Onshore Biological Resources	**BIO-5.** Update the OSCP to Protect Sensitive Resources

Text on page 4.3-140 was modified to remove mitigation measure BIO-3b from the No Project Alternative:

MM BIO-1a~~, BIO-3b~~ and MM ~~,~~ BIO-5 would no longer apply.

Text on page 4.3-144 was modified to remove mitigation measure BIO-3b from the VLCC Use of Pier 400 Alternative:

MM BIO-1a~~, BIO-3b,~~ and MM BIO-5 would still apply to vessels that visit the Marine Terminal.

4.4 AIR QUALITY

Following the release of the Draft EIR, the EIR preparers held discussions with staff of the South Coast Air Quality Management District (SCAQMD) about the models used and the results. Many of the changes in text highlighted in the following section are results of these discussions.

Text on page 4.4-11 through 4.4-13 was modified to clarify California regulated waters boundaries:

Vessel-Related Emissions

Vessel emissions result from several vessel-related activities including transit and maneuvering of tankers within California ~~coastal~~ regulated waters (within 24 nautical miles of the coastline) waters, tug assistance to and from the berths, hoteling and combustion emissions that occur during unloading, and emissions from loading products into empty vessels, which displace product volatile organic compound (VOC) vapors to the atmosphere.

The times spent by the tankers while in transit to and from the Marine Terminal were calculated from vessel speeds and transit distances. Vessels in transit to the Marine Terminal from southerly approaches release the maximum emissions, since approaches from the north and west spend less time inside the basin. The United States Coast Guard (USCG) prescribed approach routes for tankers travelling to the Marine Terminal are shown in Figure 4.4-4. For the purpose of this analysis, the southerly marine tanker trips were assumed to originate from sources south of California, such as Mexico and South America, and to enter California regulated waters ~~coastal waters~~ offshore from the California-Mexico border. Northerly trips were assumed to originate from the Middle East taking the great circle route. Westerly trips were assumed to originate from Alaska and take a route outside of the Channel Islands. Tankers enter the California regulated waters ~~coastal waters~~ at cruise speed (typically 13 to 14 knots [24.1 to 25.9 kilometers per hour {km/h}). They maintain cruise speed until they enter the Air Quality Compliance Zone (AQCZ) that extends in an arc 40 nautical miles (nm) (74.1 km) from Point Fermin; they then slow to 12 knots (22.2 km/h). They maintain 12 knots (22.2 km/h) speed until they reach the Pilot Boarding Area, approximately 3 nm (5.6 km) from the Marine Terminal. They then maneuver at a speed of 3 knots (5.6 km/h) or less, usually with tug boat assistance, from the Pilot Boarding Area to a berth at the Marine Terminal. Vessels reverse this routing when leaving the Terminal.

Text was added on page 4.4-13 to include vessels at the Federal and Foxtrot Anchorages:

Assumptions included in the calculation of maximum daily air pollutant emissions include:

- The high Reid Vapor Pressure (RVP) (a standard measurement of a liquid's vapor pressure) product loaded at Berth 3 is diesel;
- The low RVP product unloaded at Berth 4 is crude oil;
- One tanker is at Berth 3 and one tanker is at Berth 4 simultaneously during unloading and loading;
- Each tanker uses residual fuel in all engines with a worst-case fuel sulfur content of 2.5 percent, which is the level determined by the CARB surveys of vessel operators (CARB 2005a);
- The Berth 4 tanker displaces 150,000 (dead weight tons) DWT with a cargo capacity of 1.1 million barrels (bbl) of crude oil;
- The Berth 3 tanker displaces 35,000 DWT with a cargo capacity of 264,000 bbl of diesel fuel;
- Two tugs assist each tanker to berth and two provide assistance upon departure; ~~and~~
- Time estimates described in the scenarios have been rounded to the nearest whole hour;
- A 150,000-DWT tanker transits to and anchors at the ~~federal~~ Federal ES1/2 ~~anchorage~~ Anchorage and hotels; and
- A 150,000-DWT tanker is hoteling at the Foxtrot ~~anchorage~~Anchorage.

Table 4.4-4 on page 4.4-15 was modified to include vessels at anchorages:

Table 4.4-4
Current Ship Activity Worst-Case Emission Scenarios

Duration	Activity
Vessel Unloading Scenario at Berth 4	
<1 hour	One 150,000 DWT tanker enters the SCAB from the south and transits approximately 5 nm (9.3 km) at full cruise speed to the AQCZ (40 nm [74.1 km] line).
5 hours	The tanker slows to 12 knots (22.2 km/h) and transits approximately 64 nm (118.5 km) within the AQCZ to the pilot boarding area.
1 hour	The tanker maneuvers the final 3 nm (5.56 km) from the pilot boarding area to the berth. Two tugs assist tanker to mooring and vessel makes fast.
1 hours	Hotel vessel, undergo safety and other inspections.
22 hour	Hotel vessel. Unload 1.1 million bbl of low RVP product (crude) at 50,000 barrels per hour (bph) from vessel.
1 hour	Hotel vessel. Disconnect loading lines, cast off, depart to 3 nm (5.6 km) offshore. Two tugs assist tanker from berth.
Vessel Unloading Scenario at Berth 3	
<1 hour	One 35,000 DWT tanker enters the SCAB from the south and transits approximately 5 nm (9.3 km) at full cruise speed to the AQCZ (40 nm [74.1 km] line).
5 hours	The tanker slows to 12 knots (22.2 km/h) and transits approximately 64 nm (118.5 km) within the AQCZ to the pilot boarding area.
1 hour	The tanker maneuvers the final 3 nm (5.6 km) from the pilot boarding area to the berth. Two tugs assist tanker to mooring and vessel makes fast.
1 hour	Hotel vessel, undergo safety and other inspections.
22 hours	Hotel vessel. Load 264,000 bbl of high RVP product (diesel) at 12,000 bph to vessel.
1 hour	Hotel vessel. Disconnect loading lines, cast off, depart to 3 nm (5.6 km) offshore. Two tugs assist tanker from berth.
Vessels at Anchorages	
<1 hour	One 150,000-DWT tanker enters the SCAB from the south and transits approximately 5 nm (9.3 km) at full cruise speed to the AQCZ (40 nm [74.1 km] line).
5 hours	The tanker slows to 12 knots (22.2 km/h) and transits approximately 64 nm (118.5 km) within the AQCZ to the ~~federal anchorage~~Federal Anchorages.
17 hours	The vessel hotels at the ~~federal anchorage~~Federal Anchorage
24 hours	A second 150 DWT-vessel is hoteling at the Foxtrot ~~anchorage~~Anchorage.

Table 4.4-5 on page 4.4-16 was modified to include vessels at anchorages:

Table 4.4-5
Criteria Air Emissions Peak Day
Current Operations

Source	CO (lb/day)	VOC (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Marine Vessel Activities						
Tanker Transit and Maneuvering	176	2	2,235	1,403	192	177
Anchorage ES1 and Foxtrot	196	63	2,057	1,837	191	176
Hoteling/Product Transfer Engine Combustion	88	27	746	929	76	70
Product Transfer Vapor Emissions	0	2,728	0	0	0	0
Tug Boat Assistance	71	2	13	3	10	9
Total Marine Vessel Emissions	**531~~335~~**	**2,822~~2,759~~**	**5,051~~2,994~~**	**4,172~~2,335~~**	**469~~278~~**	**432~~256~~**
Stationary Sources						
Tank Emissions	0	249	0	0	0	0
Mobile Sources						
Employee Vehicle Trips	6.3	0.7	0.7	0.004	0.5	0.1
Total Emissions	**537~~341~~**	**3,072~~3,008~~**	**5,051~~2,994~~**	**4,172~~2,335~~**	**470~~278~~**	**432~~256~~**

Text regarding toxic emissions on pages 4.4-17 through 4.4-19 was modified following detailed discussions with South Coast Air Quality Management District (SCAQMD) staff following the release of the Draft EIR. Modeling input and output files and the air calculation spreadsheets were submitted to the SCAQMD staff for review:

Toxic Emissions and Impacts due to Vessel Fuel Combustion.

Toxic impacts due to fuel combustion principally produce cancer impacts due to diesel or fuel oil particulate matter emissions. ~~The incremental lifetime cancer risk associated with tanker visits to the Marine Terminal was estimated based on a health risk assessment of marine vessel emissions conducted for the Chevron Heavy Crude~~

~~Project Final EIR (SCAQMD 2006) and by Industrial Source Complex (ISC) modeling performed as part of this EIR (see Appendix E). The Heavy Crude EIR estimated the cancer risk to onshore residential receptors associated with 15 additional crude oil marine tankers per year at the Marine Terminal.Modeling of emissions from the marine tankers in the Heavy Crude EIR used the Offshore and Coastal Dispersion Model (OCD), version 5, which is designed to account for the potential differences between over water and over land dispersion characteristics. The OCD model was run with one year of meteorological data from 1996. Receptors for the modeling were located from the shoreline to approximately 3 miles (4.8 km) inland.~~

~~The results of the Chevron Heavy Crude Project EIR modeling indicated that the increase in cancer risk associated with particulate matter from the additional marine tankers associated with the heavy crude project would cause an increase of 1.6 cancer cases per million for the 15 additional tankers assessed in the Chevron Heavy Crude Project EIR. Extrapolating this to the current vessel traffic at the Marine Terminal equates to an existing baseline maximum individual cancer risk onshore of 36.8 cancer cases per million associated with the Marine Terminal current baseline operations.~~

Marine tankers emit particulate matter both while in transit to and from the Marine Terminal, ~~and~~ while moored at the ~~terminal~~berths and while awaiting access to the berths at the Federal and Foxtrot Anchorages. The distance traveled by the marine tankers within the SCAB while in transit to the Terminal is more than 60 nm (111.1 km) for the southern route. ~~According to T~~the Chevron Heavy Crude EIR, ~~did not analyze the DPM emissions from the tankers while in transit~~ as they would be dispersed over an extensive area and were not included in the health risk assessment. However, for this EIR, the baseline and proposed Project are associated with a large number of tankers. Therefore, DPM emissions were examined for vessels while at the berths (both maneuvering and hoteling)~~,~~; vessels while in transit from southerly, westerly, and northerly routes~~,~~; and vessels while located at the Federal and Foxtrot anchorages. In addition, the vessel size mix described in Section 2.0, Project Description, was included, with up to 20 percent of vessel visits being small vessels and barges.~~The tankers would be at a fixed location while moored at the Marine Terminal and the health risk assessment in the Heavy Crude EIR (SCAQMD 2006) evaluated potential impacts from DPM emissions during maneuvering and hoteling at the Terminal.~~

~~In order to check~~ confirm ~~the Chevron calculations, and to incorporate vessel transit and anchorage emissions, t~~The ISC model was used~~ing runs were performed~~ to assess the potential impact of transit, maneuvering, anchorage and hoteling DPM emissions on

onshore receptors. Although the Offshore Coastal Dispersion (OCD) model is a more accurate model for assessing dispersion over water and the water/land interface, it is limited since it only examines a single line source and a low number of receptors. The coastline of Los Angeles County is extensive and complex and the impacts of vessel transit over more than 60 nm produces impacts as far as 15 miles (24.1 km) inland. Using OCD would necessitate a very coarse grid and coarse coastline. Therefore, the ISC model was selected. The CARB utilized ISC to conduct its analysis of vessel transit and port health risks in previous studies (CARB 2006).

Meteorological information from the Hawthorn Station (the Lennox meteorological files) were used in the ISC model. Vessels in transit and maneuvering were assumed to be elevated area sources and vessels at the berths were assumed to be point sources. Point source parameters were assigned as per the POLA/POLB bay-wide Health Risk Assessment, Appendix B, Table B-1 (POLA/POLB 2009). A course grid of 1,000 meter grid spacing was utilized for initial modeling runs, with a fine grid of 25 meter grid spacing was used to identify the maximum individual cancer risk (MICR).

Utilizing the ~~unit risk factors for diesel of 3 x 10^{-4}~~ cancer potency, dose-inhalation and multi-pathway approach (as per the ~~OEHHA recommendations~~SCAQMD Risk Assessment Procedures, version 7) ~~)~~ resulted in a peak cancer risk (MICR) onshore of ~~35.2~~4~~28.26~~ cases per million~~, which is in good agreement with the Chevron calculations~~. The cancer burden associated with these emissions was estimated at ~~8.66~~.5, primarily because the one in one million cancer risk contour extends inland 15 miles (24.1 km), encompassing a densely populated area. The highest impact onshore is directly adjacent to the berths, with the maneuvering and hoteling at the berths contributing over 80~~8~~ percent to the MICR risk levels. Although transit route contributed only a small amount to the risk at the MICR location, it contributed about 8~~7~~0 percent ~~percent~~ of the risk associated with cancer burden as the impacts associated with transit route emissions are spread over a large, heavily populated area.

Additional information on the ISC modeling and the risk contours are included in ~~the~~ Appendix E.

Chronic toxicity of DPM is calculated on an annual basis. Modeling ~~from the Heavy Crude project EIR~~ indicates a DPM Chronic Hazard Index of 0.02 for current operations. DPM does not have an acute toxicity level (which is calculated on an hourly basis). However, acrolein is generally considered to be the component of diesel exhaust that produces the highest acute impacts. Acrolein emissions from diesel accounts for

approximately 0.03% of diesel exhaust PM10 emissions (according to AP-42). Modeling indicates that acrolein would produce a peak HI of 0.00935.

Toxic Emissions and Impacts Due to Vessel Loading

Emissions of VOC occur during vessel loading operations due to the movement of product into the vessel tank spaces and the displacement of product vapors out of the vessel tank spaces. The Marine Terminal utilizes vapor recovery barges equipped with carbon canisters during product loading to reduce the VOC emissions to levels less than the SCAQMD permit limit of two pounds (0.9 kg) VOC per 1,000 bbl loaded. The health risks would be a function of the types of materials being loaded onto the product vessels. The products loaded at the Marine Terminal historically have been fuel oil, diesel fuel and vacuum gas oil (year 2008). According to CARB speciation profiles (profile 760) for distillate vapors, the only component in distillate vapors that is considered a toxic component under AB2588 is n-hexane. N-hexane only presents a health risk through chronic toxicity and does not present a health risk for cancer or acute toxicity (CARB 2005b). The annual emissions of n-hexane vapors from loadings at the Marine Terminal based on the total annual barrels of product loaded (7.3 million bbl of product in 2008, not crude oil) and the CARB speciation profiles for distillate vapors, is 1,314 pounds/year (596.0 kg/year). Modeling conducted utilizing both ISC and the OCD, indicate that the onshore chronic toxicity of n-hexane from vapor emissions would produce less than a 0.001 health hazard index for chronic exposure. See the Appendix E for more details.

Table 4.4-7 on page 4.4-25 was updated with emissions information due to errors discovered in the GHG calculation spreadsheet, including VLCC transit into the basin (new numbers are underlined and deleted numbers are not included in strikethrough for better readability):

Table 4.4-7
Current Greenhouse Gases Emissions Summary

Emission Source	Annual Emissions (tons/year)		
	N_2O	CO_2	CH_4
Within SCAB			
Vessel movements (engines & boilers)	1.5	24,834	0.5
Tug assistance	0.06	5,685	0.8
Marine Terminal fugitive emissions (loading & offloading, components, tanks)	0.0	13.5	27.1
Marine Terminal indirect (electrical and offsite)	0.001	2,376	0.003
Totals	1.6	32,909	28.4
Total, CO_2 equivalent, metric tonnes	30,591		
Within California			
Vessel movements – engines & boilers	2.5	45,079	0.91~~.1~~
Tug assistance	0.06	5,685	0.8
Marine Terminal fugitive emissions (loading & offloading, components, tanks)	0.0	14	27.1
Marine Terminal indirect (electrical & offsite)	0.001	2,376	0.003
Totals	2.6	53,154	28.8
Total, CO_2 equivalent, metric tonnes	49,102		
-			
~~**Outside of SCAB and California - Worldwide**~~			
~~Vessel movements – engines & boilers~~	~~51.5~~	~~1,040,109~~	~~19.7~~
~~Total, CO_2 equivalent, metric tonnes~~	~~950,845~~		

Notes: Electrical generation assumes CALISO weighted average GHG emission rate.
California emissions include emissions within SCAB plus emissions from barges that travel the California Coast.

Table 4.4-8 on page 4.4-36 was updated to include a cancer burden threshold and to clarify greenhouse gas emissions thresholds:

Table 4.4-8
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds

Toxic Air Contaminants and Odor Thresholds	
TAC (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million, Cancer burden above 0.5, Hazard Index ≥ 1.0 (Project increment)

Greenhouse Gas Emissions[1]	
CO_2, N_20, CH_4, etc	If the Project's GHG emissions are less than or mitigated to less than 10,000 metric tonnes CO_2 equivalent per year the Project is presumed to be insignificant for GHG. If an existing project emits more than 10,000 metric tonnes of CO_2 per year, then any increases above the baseline level would be significant.

Text on page 4.4-42 was modified:

The maximum onshore annual NO_2 concentration is estimated based on ISC modeling for annual impacts associated with hoteling of the vessels in the year 2040. Modeling indicates that the impacts of NO_2, assuming complete conversion of the NOx emissions to NO_2 due to the distance from the berths to onshore areas, would be ~~less~~ about ~~than~~ one part per billion (0.001 ppm). This would be less than significant for annual localized NO_2 impacts. See Appendix E for more information on modeling results.

Text discussing AQMP consistency was modified on pages 4.4-43 and 4.4-44 following detailed discussions with South Coast Air Quality Management District (SCAQMD) staff:

The 2007 AQMP measure MOB-03 addresses port activities emissions~~, and is defined as the following in the 2007 AQMP~~:

This proposed control measure will address emissions from all new and existing stationary and mobile sources at ports and port-related facilities, including nonattainment criteria pollutants and toxics emissions. The objective of this backstop measure is to ensure the adequacy of and effective implementation of port measures

and strategies proposed or developed by ports or CARB. Possible control approaches include limitations on increases in health risks caused by toxic air contaminants; reduction of health risks caused by toxic emissions from ports and port projects; prevention of emission increases of nonattainment pollutants for port projects; and emission reduction goals for ports to implement AQMP measures.

The Marine Terminal facility would comply with all ~~SCAQMD~~ CARB rules, such as the use of low sulfur fuels (13 CCR § 2299.2 and 17 CCR § 93118.2) and vessel speed reduction, ~~based on~~as indicated in the AQMP ~~emissions~~ control measure~~s~~. The vessel speed reduction also addresses GHG emissions reduction, according to AB32. The state SIP indicates that NOx emissions from ships and boats within the SCAB would increase by 2.6 percent per year from 2006 to 2023, which is less than the proposed project rate of increase in vessel visits. The primary SIP measure to reduce emissions from ships is the use of lower sulfur fuel, which is a mitigation measure for accelerated implementation for both main engines and auxiliary engines, ~~which is~~ in line with the SIP.

In addition, the facility already operates in compliance with a current SCAQMD air permit related to emissions of VOC during vessel loading (the use of a barge with carbon canisters). Therefore, the proposed Project is consistent with the AQMP (Class III).

Discussion of impact AQ-1 and mitigations measure AQ-1 was modified on pages 4.4-44 through 4.4-46 following detailed discussions with South Coast Air Quality Management District (SCAQMD) staff:

Impact AQ–1: Exceedance of Incremental Health Risk Threshold During Project Operations

Operational diesel particulate matter emissions from additional marine tankers could exceed the SCAQMD significance threshold for incremental cancer or chronic risk (Potentially Significant but Mitigable, Class II).

Impact Discussion

Recent studies have shown that for projects involving ocean-going vessels, the toxic air contaminant of primary concern is DPM and the health effects scenario of primary concern is individual lifetime cancer risk (CARB 2006, POLA 2008b). Because cancer risk estimates are based on long-term exposure periods of up to 70 years for residential receptors, a project's long-term emissions, rather than peak daily emissions, are used to

calculate cancer risk. A project's long-term emissions are also used to calculate chronic hazard indices.

By contrast, the acute hazard index is based on peak one-hour emissions. ~~Because peak short-term emissions would not change, operation of the project would not impact the acute hazard index.~~Peak one-hour impacts would be the same as the current operations as the peak hour and peak day would not change for future operations.

Although maximum daily or hourly emissions would not increase at the Marine Terminal, annual emissions may increase, as additional tankers would deliver the additional crude oil and partially refined product and carry away additional product.

The maximum annual average onshore DPM concentration from transit, maneuvering, hoteling and anchorage emissions was estimated ~~by the Heavy Crude Project EIR~~utilizing the ISC model for an increase in tanker operations~~ and modeled in this analysis~~. ~~Scaling this concentration to the~~The proposed Project additional tankers per year expected in 2040 yields an onshore maximum cancer risk of ~~51.6~~39.6~~ using the Heavy Crude Project modeling results~~, which would be a significant impact under the SCAQMD threshold criteria (greater than 10 cancer cases per million or a health hazard index of 1.0, see Table 4.4-8) as this would be an increase above the baseline cancer risk for an individual receptor of more than 10 in a million. The cancer burden would be an estimated 10.8 under the future operations.

To determine the non-cancer, ~~acute~~ chronic health impacts associated with the proposed Project DPM emissions, the final year of the lease was analyzed. ~~Scaling from the Heavy Crude Project EIR~~Modeling results indicate ~~yields~~ a maximum incremental ~~acute~~ chronic hazard index for DPM ~~of~~ of 0.02~~3~~, which is below the SCAQMD significance threshold of 1.0 (SCAQMD 2006). Modeling of n-hexane chronic emissions also indicates that the n-hexane HI would be less than .001. This would be a less than significant impact. Please see Appendix E for the modeling results and calculations.

Mitigation Measure

AQ-1. Low Sulfur Fuels in Marine Main and Auxiliary Engines and Speed Limits. Starting at the beginning of the new 30-year lease period and continuing throughout the 30-year lease period, all main and auxiliary engines on crude oil marine tankers calling at the Chevron El Segundo Marine Terminal shall use marine diesel oil or marine gas oil with a

maximum of 0.1~~2~~ percent sulfur by weight. In the event that marine diesel oil or marine gas oil with maximum 0.1 percent sulfur by weight content is not available, tankers shall use marine diesel oil or marine gas oil with maximum 0.2~~%~~ percent sulfur by weight content. This measure shall apply while the tankers are in waters of the South Coast Air Basin as defined in the South Coast Air Quality Management District (SCAQMD) Rule 1142~~within 20 nautical miles (37.0. kilometers) of Point Fermin~~, including while hoteling or transferring product at the Marine Terminal. In addition, all marine tankers calling at the Chevron El Segundo Marine Terminal~~,~~ shall reduce speed to 12 knots within waters of the South Coast Air Basin as defined in AQMD Rule 1142.~~, and the POLA/POLBmain engines while in transit and auxiliaryauxiliaryauxiliary or the use of slide valves or other technologies to reduce DPM from main engines while in transit within District waters~~

Rationale for Mitigation

MM AQ-1 would reduce DPM emissions from marine tanker auxiliary engines during transit, hoteling, and product transfer at the Marine Terminal. This measure would apply to all tankers calling at the Marine Terminal, not just the potential additional tankers associated with the proposed Project. San Pedro Bay Ports Clean Air Action Plan measures OGV-3 and OGV-4 specify using lower sulfur fuel; the measures require using lower sulfur distillate fuels in the auxiliary engines of ocean going vessels within 20 nm (37.0 km) of Point Fermin and while at berth (POLA and POLB 2006).

Recent regulations (CARB Ocean-Going Vessel Auxiliary Diesel Engine Regulation Title 13 CCR 2299.1 and Title 17 CCR 93118) required ship auxiliary engines operating in California Regulated W~~w~~aters (within 24 nautical miles) to use MDO with a maximum of 0.5 percent sulfur by weight or use marine gas oil, effective January 1, 2007. Then, starting on January 1, 2010, auxiliary engines operating in California waters must meet a second set of emission limits.

Maintaining a speed of 12 knots within the SCAB ~~ensures that emissions are~~ reduces emissions since the emissions per unit of distance decrease as the vessel goes slower. The speed of 12 knots balances the need~~s~~ for reduced emissions with the need to move cargo. The 12-~~-~~knot speed is also recommended in the San Pedro Bay Ports Clean Air Action Plan measure OGV-1, Vessel Speed Reduction,

~~to the MICR auxiliaryauxiliaryauxiliaryWhile the emissions from the main engines do not contribute significantly to the MICR, they do contribute the majority of the cancer burden as they are spread out over a large, populated area. . as well as othersreport (POLA/POLB 2010) By implementing a program, in coordination with the SCAQMD, CARB and the POLA/POLB ongoing programs, to test and implement various retrofit technologies, the emissions could be reduced. However, minimized related to vessel speed.The use of 0.2 percent sulfur fuel, as opposed to 0.1 percent sulfur fuel, is primarily due to the limited supply of 0.1 percent sulfur fuel (POLA 2008b). Other EIR, including the recent Pier 400 EIR, prescribe the use of 0.2 percent sulfur fuel as mitigation measure due to the lack of availability of 0.1 percent sulfur fuel (POLA 2008b).~~

Residual Impacts

EAuxiliary engines using ~~MDO~~ fuel with a sulfur content of 0.1~~2~~ percent would reduce NOx emissions by 10 percent (over 2.5 percent fuel oil), DPM emissions by 65~~4~~ percent, and SOx emissions by 96~~3~~ percent (SBPB 2006). A reduction in DPM emissions of 65~~4~~ percent would reduce MICR ~~cancer risk~~ to 13.8~~18.6~~ cases per million, and would reduce the cancer burden to an estimated ~~1.~~2.9, which would ~~still~~ be ~~considered a significant impact (greater than 10 cancer cases per million or a health hazard index of 1.0, see Table 4.4-8)~~less than the cancer MICR and burden associated with the current~~,~~ baseline operations Maximum individual incremental cancer risk levels at each receptor would actually decrease under the mitigated proposed Project compared to the baseline levels. This would therefore be less than significant with mitigation (Class II).

Table 4.4-11 on page 4.4-47 was updated with emissions data (new numbers are underlined and deleted numbers are not included in strikethrough for better readability):

Table 4.4-11
Proposed Project Greenhouse Gases Emissions Summary

Emission Source	Annual Emissions (tons/year)		
	N_2O	CO_2	CH_4
Within SCAB			
Vessel movements – engines & boilers	2.1	34,853	0.7
Tug assistance	0.08	7,979	1.1
MT fugitive emissions (loading & offloading, components, tanks)	0.0	17.4	34.7
MT indirect (electrical & offsite)	0.001	3,307	0.003
Totals	2.2	46,157	36.5
Future Total, CO_2 equivalent , metric tonnes	42,485		
Current Total, CO_2 equivalent , metric tonnes	30,591		
Increase	12,253		
Within California			
Vessel movements – engines & boilers	3.53	63,267	1.2
Tug assistance	0.08	7,979	1.1
MT fugitive emissions (loading & offloading, components, tanks)	0.0	17	34.7
MT indirect (electrical & offsite)	0.001	3,307	0.003
Totals	3.6	74,571	37.1
Future Total, CO_2 equivalent , metric tonnes	68,824		
Current Total, CO_2 equivalent, metric tonnes	49,102		
Increase	19,722		
~~**Outside of SCAB and California - Worldwide**~~			
~~Vessel movements - engines & boilers~~	~~72.3~~	~~1,459,750~~	~~27.7~~
~~Future Total, CO_2 equivalent, metric tonnes~~	~~1,334,471~~		
~~Current Total, CO_2 equivalent, metric tonnes~~	~~950,845~~		
~~Increase~~	~~383,626~~		

Notes: MT = Marine Terminal
Electrical generation assumes CALISO weighted average GHG emission rate. California emissions include emissions within SCAB plus emissions from barges.

Emissions of GHG

Discussion about mitigation measure AQ-2 was modified on pages 4.4-48 and 4.4-49:

Mitigation Measure

AQ-2. Greenhouse Gas Monitoring and Reduction Strategies. The Applicant shall implement a program to quantify and ~~reduce~~ report to the ~~CSLC~~California State Lands Commission staff greenhouse gas emissions associated with Marine Terminal operations within the South Coast Air Basin (SCAB) and within California. If these emissions exceed the GHG emissions estimates associated with the baseline operations, then a GHG emission reduction program shall be implemented~~,~~ to reduce emissions to less than the baseline GHG emissions. The program could include measures such as: using green electrical power to run onshore equipment; requiring tugs to use biodiesel; ~~using marine diesel oil fuels in vessel main and auxiliary engines while in the SCAB~~utilizing shore power systems; utilizing shore-side pumping systems instead of vessel-powered pumps; further ~~and~~ reducing vessel speed while in the SCAB; or other measures including offsite GHG reduction programs in the community~~within one year of lease renewal and submit reports to CSLC annually thereafter~~.

Rationale for Mitigation

As there is uncertainty as to the extent to which vessel visits would increase over the lease terms, the Applicant shall estimate GHG emissions associated with operations and, if the GHG emissions exceed the baseline levels, reduce these GHG emissions to below baseline levels. Several measures could be implemented to reduce GHG emissions, including using green power, requiring tugs to utilize biodiesel or other alternate fuels, using ~~MDO fuel~~shore power or shore pumps, and reducing the speed of vessels while within the SCAB. Both the use of green power and the use of biodiesel in tugs would reduce GHG emissions since renewable energy sources and biodiesel emit fewer, if any, lifecycle GHG emissions. ~~The use of MDO fuel could reduce GHG emissions by two percent due to the slightly lower carbon content of MDO compared to residual fuel oil (IMO 2009).~~ The reduction of vessel speeds produces fewer emissions on a per mile basis due to the power law relationship between vessel speed and fuel use (Psaraftis 2009).

Residual Impacts

A combination of these measures could reduce the GHG emissions to below the ~~10,000 tons per year SCAQMD~~ threshold ~~for stationary sources~~. However, the ability

to implement some of these measures is uncertain; therefore the impacts would still be potentially significant under the proposed Project scenario (Class I).

Table 4.4-12 on page 4.4-49 to update mitigation measures:

Table 4.4-12
Summary of Air Quality Impacts and Mitigation Measures
Proposed Project

Impact	Mitigation Measures
AQ-1: Exceedance of Incremental Health Risk Threshold During Project Operation	**AQ-1.** Low Sulfur Fuels in Marine Main and Auxiliary Engines and Speed Limits
AQ-2: Emissions of Greenhouse Gases within the SCAB Could Exceed SCAQMD Thresholds	**AQ-2**. Greenhouse Gas Monitoring and Reduction Strategies

Text on page 4.4-51 was modified:

GHG emissions would be reduced within the SCAB and California under this alternative since there would be fewer vessel calls at the Marine Terminal. The GHG emissions compared to emissions associated with current operations within the SCAB would increase. ~~However, worldwide GHG emissions would be the similar to the proposed project~~ (see Appendix E).

Table 4.4-14 on page 4.4-53 was updated to include emissions data for vessel anchorages (new numbers are underlined and deleted numbers are not included in strikethrough for better readability):

Table 4.4-14
Criteria Air Emissions Peak Day
Alternative Operations

Source	CO, lb/day (kg/day)	VOC, lb/day (kg/day)	NO_x, lb/day (kg/day)	SO_x, lb/day (kg/day)	PM_{10}, lb/day (kg/day)	$PM_{2.5}$, lb/day (kg/day)
Marine Vessel Activities						
Tanker Transit and Maneuvering	210 (95.3)	2 (0.9)	2,676 (1213.8)	1,665 (755.2)	229 (103.8)	211 (95.7)
Anchorages ES1/2 and Foxtrot	196 (60)	63 (19)	2,057 (627)	1,837 (560)	191 (58)	176 (54)
Hoteling/Product Transfer Engine Combustion	88 (39.9)	27 (12.2)	746 (338.4)	929 (421.4)	76 (34.5)	70 (31.8)
Product Transfer Vapor Emissions	0 (0)	2,728 (1237.4)	0 (0)	0 (0)	0 (0)	0 (0)
Tug Boat Assistance	71 (32.2)	2 (0.9)	13 (5.9)	3 (1.4)	10 (4.5)	9 (4.1)
Total Marine Vessel Emissions	566 (172)	2,822 (860)	5,492 (1,674)	4,433 (1,351)	506 (154)	466 (142)
Stationary Sources						
Tank Emissions	0 (0)	249 (112.9)	0 (0)	0 (0)	0 (0)	0 (0)
Mobile Sources						
Employee Vehicle Trips	6.3 (2.9)	0.7 (0.3)	0.7 (0.3)	0.004 (0.002)	0.5 (0.2)	0.1 (0.0)
Total Emissions	**572 (174)**	**3,072 (936)**	**5,493 (1,674)**	**4,433 (1,351)**	**507 (154)**	**466 (142)**
Change from Proposed Project	+35 (15.9)	0 (0)	+441 (200.0)	+2621 (118.4)	+37 (16.8)	+34 (15.4)
Significance Threshold	550 (249.5)	55 (24.9)	55 (24.9)	150 (68.0)	150 (68.0)	55 (24.9)

Text on page 4.4-55 was modified to clarify emissions under the VLCC use of Pier 400 alternative:

There would be a reduction in GHG emissions in the SCAB associated with this alternative ~~as there would be fewer~~ vessels calling at the Pier 400 could take advantage on shore-side power systems~~Marine Terminal and the Pier 400 (due to the elimination of Marine Terminal related lightering)~~.

Text was inserted into the Cumulative Projects Impact Analysis on pages 4.4-55 through 4.4-56 :

The proposed Project would increase Marine Terminal traffic over the lease term, which would not necessarily correspond to an increase in Refinery emissions. Several scenarios could increase vessel calls at the Marine Terminal, including:

1. Increases in exports from the Refinery through the Marine Terminal;
2. Reduced onshore pipeline deliveries of crude oil to the Refinery;
3. A change in the mix of vessels visiting the Marine Terminal, with a shift away from larger vessels from the Middle East region to smaller regional vessels; and
4. Increases in Refinery demand for crude oil that could not be made up from onshore pipeline deliveries.

The first three scenarios would not change emissions at the Refinery or the amount of crude oil processed at the Refinery. The fourth scenario would increase Refinery crude oil processing and could increase Refinery emissions. However, several existing SCAQMD permits, that historically undergo CEQA review, address Refinery emissions. The permits operating parameters and emissions limits would require review and revisions if Refinery emissions are increased. If Refinery emissions increase in the future, the permit revision process or a separate CEQA process would address the increase. In addition, the Refinery is a member of the SCAQMD Regional Clean Air Incentives Market program, and emissions increases would need to be offset by emission credits purchased from other community sources. Also, no specific projects are proposed at the Refinery that would increase Refinery throughput or vessel calls. The EIR analyses impacts of the Marine Terminal operations that may increase in the future due to Refinery changes. However, the proposed Project itself would not change Refinery operations.

Refinery operations could conceivably increase even without an increase in traffic through the Marine Terminal if, for example, pipeline deliveries increased because the Applicant acquired onshore assets currently going to a different Refinery. Therefore, there is no absolute direct correlation between Marine Terminal vessel calls and Refinery output. Impacts on the Refinery from Marine Terminal activities would be speculative and Refinery increases in emissions may in fact be unrelated to the Marine Terminal activities.

4.5 AESTHETICS

Text was changed on page 4.5-22 to reflect the deletion of mitigation measure BIO-3b:

However, Impact **AES-1** (Class I) would occur in the event of an oil spill accident and would be the same as the proposed Project. **MM SSR-1a** and **SSR-1b**, **SSR-2a** through **SSR-2k**, **BIO-1a** and **BIO-1b**, and **BIO-3a** ~~and **BIO-3b**~~ would be implemented, but the impact would remain significant after implementation (Class I).

4.6 GEOLOGICAL RESOURCES

Mitigation measures GEO-1b and GEO-1c and the rationale for mitigation were modified on pages 4.6-28 and 4.6-29:

GEO-1b. Seismic Resistant Design. The Applicant shall perform seismic evaluation and design for all existing facilities or pipelines and employ current industry seismic design guidelines including but not limited to: Guidelines for the Design of Buried Steel Pipe by American Lifeline Alliance (2001), Guidelines for the Seismic Design and Assessment of Natural Gas and Liquid Hydrocarbon Pipelines by Pipeline Research Council International ~~(PRCI)~~ (2004), and California State Lands Commission Marine Oil Terminal Engineering and Maintenance Standards for seismic resistant design of the pipeline. The seismic evaluation of existing facilities shall be conducted in accordance with the Local Emergency Planning Committee Region 1 Guidance for California Accidental Release Prevention ~~(CalARP)~~ Seismic Assessments including a walkthrough by a qualified seismic engineer. In addition, post-event inspections must follow the Marine Oil Terminal Engineering and Maintenance Standards guidelines. This evaluation and design shall be conducted within one year of lease renewal and reports submitted to California State Land Commission ~~CSLC~~ staff annually thereafter.

GEO-1c. Seismic Inspection. During the term of the 30-year lease, the operator shall cease associated pipeline operations and inspect all project-related pipelines and ~~storage tanks~~equipment following any seismic event in the region (Los Angeles County and offshore waters of the Santa Monica Bay and southern Channel Islands) that ~~exceeds~~ produces a ground acceleration of 5~~13~~ percent of gravity (0.05~~13~~ g) at the Marine Terminal site. The operator shall report the findings of such inspection to the California State Lands Commission, the city of El Segundo, and the County of Los Angeles. The operator shall not reinstate operations of the Marine Terminal and associated pipelines within the city of El Segundo until authorized by the California State Lands Commission.

Rationale for Mitigation

By incorporating site-specific earthquake-resistant design into newly engineered facilities, and performing inspections after all great seismic activity, impacts from future seismic activity can be reduced. Ground acceleration is the primary determinant factor in assessing equipment damage. Measurements of ground acceleration can be achieved by installing an accelerometer or utilizing a nearby accelerometer (associated with TriNET, installed by the USGS at Los Angeles International Airport) or other agency or institution.

4.7 LAND USE, PLANNING, AND RECREATION

Text on page 4.7-1 was modified to clarify the lease boundaries:

The Marine Terminal is in the southwest portion of the city of El Segundo along the northern border of the city of Manhattan Beach. The Marine Terminal facilities as per the CSLC lease are located ~~both~~ offshore and within tidelands. O~~o~~nshore portions of the facility support the offshore activities. The onshore facilities are on a 9-acre (3.6-hectare) Chevron-owned strip of land below the Chevron Refinery, between Vista del Mar to the east and a public beach to the west along the shoreline. The onshore facilities are primarily screened from public view by a landscaped chain-link fence along the eastern property line.

Text was added on page 4.7-4 to include recently approved lifeguard and public restrooms:

The sandy beach area adjacent to the Marine Terminal onshore facilities is accessible to the public. A public bike path maintained by the County of Los Angeles runs along the sandy beach seaward of the Marine Terminal's onshore facilities. The bike path traverses the entire length of the beach and is used extensively by bikers and joggers. The nearest vertical access to the shoreline for the public is located immediately north of the Marine Terminal site via the El Segundo Beach parking lot and approximately 0.5 miles (0.8 kilometers [km]) south in the El Porto neighborhood of Manhattan Beach. El Segundo Beach has two sand volleyball courts for public use adjacent to its parking lot area. Other nearby state beaches include Dockweiler State Beach, north of El Segundo Beach, and the Strand in Manhattan Beach, to the south. More recently, the City of El Segundo approved lifeguard facilities and public restrooms in an area northwest of the Marine Terminal on land donated by Chevron.

Text on page 4.7-32 and Table 4.7-1 on page 4.7-32 were changed to reflect the deletion of mitigation measure BIO-3b:

The potential for accidental oil releases to affect recreation activities would be mitigated by adhering to the measures provided in the Oil Spill Contingency Plan and identified in **MM SSR-1a** and **SSR-1b**, **SSR-2a** through **SSR-2k**, and **SSR-3** and **MM BIO-1a** and **BIO-1b**, **BIO-3a** and ~~**BIO-3b**~~, **BIO-4**, and **BIO-5**.

Table 4.7-1
Summary of Significant Land Use, Planning, and Recreation Impacts and Mitigation Measures
Proposed Project

Impact	Mitigation Measures
LUPR-1: Accidental Oil Releases Could Affect Recreational Activities	Measures provided in the Oil Spill Contingency Response Plan and **MM SSR-1a** and **SSR-1b**, **SSR-2a** through **SSR-2k**, and **SSR-3** and **MM BIO-1a** and **BIO-1b**, **BIO-3a** and ~~**BIO-3b**~~, **BIO-4**, and **BIO-5**

4.9 ENERGY

Text was added on page 4.9-11 to clarify impacts to access of strategic energy supplies:

In addition, the abandonment of one of the three locations in the Southern California area that receives crude oil would increase the level of energy supply disruptions. The Marine Terminal serves the Chevron Refinery, which is a major supplier of gasoline to Southern California. A reduction of Refinery output would have a significant negative impact on the economy of the region and the State. Moving operations to a nearby port could result in the loss of an alternative supply of crude oil, not only for this refinery but for others, if civil unrest (i.e., terrorist attack) or a natural disaster (i.e., earthquake) disrupted port operations, either of which could make crude oil originating from the alternative port location unavailable for extended periods of time. As a matter of national security, it is valuable to have access to multiple sources of strategic supplies. Therefore, this would be a significant impact.

7.0 MITIGATION MONITORING PROGRAM

Tables in the mitigation monitoring program were updated to reflect changes to impacts and mitigation measures. Section 7.0, Mitigation Monitoring Program, is included as Attachment A to this report.